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SYMPOSIUM ON APPENDICITIS

A Symposium on Appendicitis was held at the Scientific Section of XXIV All-India Medical Conference, Bombay, on 29-12-47 with Lt.-Col. Mirajkar (Punjab) as president.

Speakers: K. G. PANDALAI, M.B.C.M., F.R.C.S. (ENG.), LT.-COL., I.M.S. (RETD.), Madras—The Diagnosis of Appendicitis. P. RAGHAVAN, M.D., Bombay—Medical Aspects of Appendicitis. S. N. DEBOO, M.B., M.R.C.S. (ENG.), Bombay—Radiological Aspects of Appendicitis. S. R. MOOLGAVKAR, F.R.C.S., Bombay—Treatment of Appendicitis.

THE DIAGNOSIS OF APPENDICITIS

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ACUTE ATTACKS

In all cases an early diagnosis is essential as treatment can be adopted without delay and thus many lives are saved and complications avoided.

The prevalence of the disease is admitted and the profession is alive to the dangers of delay in proper treatment. Our old notions about appendicitis occuring only in people of certain countries or in meat-eaters are exploded. We see now that it occurs in all age groups, in the small infant as in the very old person, high and low, and in both sexes.

In making a diagnosis, one relies on clinical examination and the history. No special equipment is required and where a history of repeated attacks of pain and tenderness in the right iliac fossa is elicited, the presumption is strongly in favour of appendicitis, but of course there are exceptions to every rule, and in differential diagnosis, one has to be alive to other possibilities. Generally, an acute abdominal condition presents itself and if in a young adult in good health and at work, a feeling of indisposition for some hours followed by pain in the umbilical region or in the epigastrium, finally localising in the right iliac fossa with a slightly elevated temperature and nausea or vomiting develops, a strong suspicion of appendicitis should always arise. The symptoms vary in severity according to the patient; in a young adult symptoms are pronounced but in the older patient, they are less well-marked. We must not forget our teaching and publicity about this disease have caused an appendixphobia and many patients will not be happy unless their appendices are removed.

Normally the organ is a blind finger-like protrusion on the median side of the cæcum, admitting and discharging intestinal contents freely, but occasionally as a result of a healed ulcer or abnormality of development, the organ may not admit intestinal contents freely or admit it in one direction only into the lumen of the organ, but not outwards. In such cases, either a constriction is present at the aperture or a fold of mucous membrane acts in a valve fashion. The causative organisms of inflammation are the bacilli and cocci normally inhabiting the bowel such as the streptococcus, the staphylococcus, B. coli, etc. Rarely the tubercle bacillus or the Entamœba is the causative organism.

It is well-known that the appendix may occupy different regions of the abdomen due to malrotation of the gut, and symptoms especially pain and rigidity may, therefore, vary in location, such as, *e.g.*, it may occur in the sub-hepatic or left inguinal regions. In a pelvic appendix all symptoms are masked and a suspicion of tubal trouble may arise. In every case, therefore, a rectal examination should not be omitted. The pain of appendicitis also varies in nature according to the pathology present. If the appendix is filled with a thick purulent secretion which cannot easily discharge into the cæcum on account of a constriction near its cæcal opening, the colicky type of pain may occur. If on the other hand, the secretions from within cannot escape at all into the bowel, then the infected contents may destroy the containing wall progressively causing ulceration, gangrene and finally perforation. In these cases, the pain is of a tearing, bursting type and urgent action is called for. One should remember that in the lax abdomen of an elderly multiparous female or in an old man, the pain may be very slight or absent, and rigidity of the right iliac fossa may be absent even though advanced gangrene of the appendix may be present. The difficulties of diagnosis of acute appendicitis in pregnant women nearing full term should be remembered.

One might classify all cases of appendicitis as those with a lump in the right iliac fossa and those without lump formation. In the early stages of an acute attack, the lump may be a temporary formation. Adhesions of the great omentum and bowels round the seat of inflammation generally disappear with time as the attack subsides, but the time taken may in other cases be prolonged. For, if the appendix has caused an extramural infection or abscess round it, many weeks, nay months, may be required for the absorption of the lump. An abscess may require surgical drainage. Puzzling are those cases which simulate appendicitis and in them the lump needs investigation with the help of x-rays. It is well, therefore, in all cases of appendicitis to take a plain x-ray picture of the abdomen to help rule out calculi in the ureter or gall-bladder. Much was thought in the old days of leucocytosis in the diagnosis of this disease. It may lend some assistance, but it is better to rely on clinical examination and the judgment of the doctor. A complete examination including the urine and fæces is indispensable and it is good to get a second opinion if the practitioner is not himself a specialist accustomed to handle these cases. Again, in the tropics the frequency of amœbic infection of the large bowels and liver should be remembered and examination of the stools should be a routine in all cases.

Recurrent Attacks

Many cases give a history of several previous attacks cured by conservative treatment and there may be no rigidity or tenderness or lumps in the right iliac fossa during the so-called quiescent period when x-rays may help in the diagnosis of such cases. After a detailed study of the patient and elimination of other conditions, a clinical diagnosis of appendicitis should be possible.

There are certain pitfalls in the diagnosis if emphasis is laid on individual symptoms only and not on the whole picture which is slow in development. Conditions in the chest, spine and spinal cord and in the abdomen, the pelvic cavity in women should not be forgotten.

Chronic Cases

There are a number of cases of patients complaining of pains and discomfort referred to the right iliac fossa, but who have not suffered previously from acute attacks. In such, there is generally no lump to be felt. Some are neurotic, some old colitis cases. In these laparotomy has disclosed an organ often free from adhesions but with scarred lumen or no lumen at all. Strictures, sometimes holding scybala, others undigested vegetable fibres and others containing the thread worm occur. In such, removal of the organ has given relief for a time, but late results have shown that other functional derangements, *e.g.*, acid eructations, poor appetite, constipation, etc. continue and falsify the early hopes of complete relief. These cases are, therefore, not those of pure appendicitis but composite pictures in which other organs are involved.

MEDICAL ASPECTS OF APPENDICITIS

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Appendicitis constitutes an important problem because of its frequency as a cause of 'acute abdomen'. Though once a diagnosis of appendicitis is made the management is essentially surgical, there are certain aspects which interest us all whether in general practice or in a speciality. I propose to consider a few of these points which have interested me and I hope they will interest you also.

We may recall here that though the recorded history of appendix begins very early, the condition was defined and named only sixty one years ago when in 1886 Fitz published his paper on "Perforating Inflammation of the Vermiform Appendix with Special Reference to its Early Diagnosis and Treatment." A year later the first successful removal of the appendix, after a correct pre-operative diagnosis, was performed by Morton. Since then the names of a number of surgeons have been associated with advances in the treatment of the condition, particularly those of Ochsner, McBurney and Fowler, who himself died of appendicitis. In England the diagnosis became popular after King Edward VII had an attack of appendicitis, which resulted in the postponement of his scheduled coronation. The name of Treves, the surgeon who operated on King Edward, will be remembered as an advocate of early operation. Here again is a ring of tragedy as Treves's daughter died of appendicitis before the surgeon could operate on her.

The days when surgeons were bred in the fear of the Lord and of the peritoneum are gone by, and the considerable advances in operative surgery and chemotherapy that have occurred since, have reduced the operative risk to practically zero. But appendicitis still remains a challenge to the profession because it claims a number of lives every year.

There are peculiarities in the structure and function of the appendix which make it liable to repeated attacks of obstruction and inflammation. The mucosa has in it folds which vary in number, 'the fold of Gerlach', and the function of these folds is not clear. It has a very rich component of lymphoid tissue so much so that it has been called the abdominal tonsil. The presence of this lymphoid tissue makes it more liable to infection. The appendix has been regarded in the past as a vestigial organ with no function. It exhibits peristaltic movements and Wangensteen and his collaborators have shown that it secretes fluid and it is this secretory function that makes it the Uriah Heep of the abdomen, treacherous and unreliable. It is this secretory function which makes it particularly liable to rupture following rising intraluminal pressure, in cases of appendicular obstruction.

Pathological changes resembling those seen in appendicitis in human beings have been produced in chimpanzees and in guerillas, by luminal obstruction experimentally by Wangensteen and Dennis (1940).

Bowers (1939) was able to demonstrate intraluminal obstruction in 80 per cent of cases of appendicitis for which appendicectomy had been done. In 67 per cent of these cases the obstruction was due to an impacted fæcalith. We are inclined to wait for signs of inflammation of the peritoneum like muscle guarding, fever, fast pulse, and leucocytosis, for the diagnosis of appendicitis. But we must realise as Wangensteen has emphasised that the condition is one of a closed loop obstruction and should not wait for the above mentioned signs to appear for a diagnosis to be made.

No age, climate, season, occupation, social status, or dietary habit seems to exempt one from an attack of appendicitis. Neither childhood nor old age is exempt. The increased liability of the female to an attack during pregnancy has been commented upon. All these three factors introduce special problems in the management of the condition.

In children the main difficulty is to differentiate the condition from an attack of pneumonia. In these children one does not get any help from the patient and the diagnosis has to be made as early as possible from the physical examination alone. Howland has mentioned that a child with pneumonia is restless, has a flushed face, and an increased frequency of respirations of the abdominal type. On the contrary a child with appendicitis is quiet, lying flat in bed, has a facial pallor and the breathing is of the thoracic type and the abdomen moves very little or not at all. Stone (1935) has pointed out that three factors influence mortality adversely in children, namely, (1) duration of the disease before operation; (2) rupture and consequent peritonitis, and (3) administration of a cathartic. Hence early diagnosis and withholding of purgatives and sedatives until a positive diagnosis has been arrived at, in cases of abdominal pain in children, and early operative management, are essential if the mortality rate is to be reduced.

In the aged the symptomatology is no different from that in adults but the condition is characterised by greater rapidity of development, the increased virulence of the infection, and the tendency of the appendix to become gangrenous and slough away. These factors together with the poor operative risk in the elderly, call for early but conservative surgical management.

A form of acute appendicitis which is sufficiently frequent in this country is appendicitis caused by Entamœba histolytica. Strong in the United States reported 7 cases of appendicitis in 100 fatal cases of amœbic dysentery. Clarke reported ulcerative appendicitis in 76 of 186 autopsies upon cases of amœbic dysentery. It is important to bear in mind that about 40 per cent cases of amœbic dysentery suffer from appendicitis considering the frequency of amœbiasis in general in this country. Surgical intervention is attended by uniformly fatal result in these cases, and conservative medical management is followed by recovery. The diagnosis and differentiation from other forms of appendicitis may not be easy, because the symptoms do not differ in any way from that due to other forms of appendicitis, and there may be leucocytosis varying from 10,000 to 30,000 per c.mm. The only way to differentiate, is to keep the possibility in mind and get the fæcal material obtained on rectal examination examined for Ent. histolytica.

I should like to say a few words about chronic appendicitis. It has been questioned whether there is an entity of that type. Is one justified in diagnosing appendicular dyspepsia? What are the roentgenologic criteria of a diagnosis of chronic appendicitis? Can we guarantee relief from symptoms after appendicectomy to a patient who comes to us with the so-called chronic appendicitis or appendicular dyspepsia? These are questions which confront us every now and then, in the course of our practice.

There is some experimental and pathological evidence in favour of the existence of chronic appendicular dyspepsia. Aschoff (1932) stated that 80 per cent of old people show microscopic evidence of previous appendicitis. It has been contended by some that these changes may be consequent to aging. Pathologists like Cutler and Boyd contend that previous attacks of acute appendicitis convert the mucosa into dense fibrous tissue and that fibrous tissue strands invade the submucosa and the muscularis. Bowers (1939) noted marked fibrous changes in the muscular coat of appendices removed for chronic appendicitis. He adduced evidence to show that pain is due to spasm of the muscularis rather than to disturbed function and was able to produce sharp pain in the right iliac fossa by faradic stimulation of the exteriorised appendix. Ivy (1934) noticed inhibition of gastric movements and contraction of the pylorus on distension of the appendix like cæcum of the dog. Apparently disturbed activity of the appendix may result in reflex pylorospasm.

One comes across patients who complain of vague soreness in the right iliac region, have a tired feeling, and have distension of abdomen after meals, with perhaps a feeling of nausea. A number of patients with these symptoms will on investigation turn out to be cases of chronic amœbiasis and will respond to amœbicidal therapy. In the rest an appendicectomy may be contemplated. Under what circumstances could one expect relief from these symptoms after appendicectomy? Alvarez (1940) made an interesting study on patients whose appendices had been removed, with a view to answer this question. As a result of his study he formulated that one could expect the patients to have complete relief from symptoms after the operation if (1) they had one or two antecedent attacks of acute abdominal pain suggestive of acute appendicitis, or (2) it is a young boy or girl who had been previously healthy and has started with these symptoms suddenly. One other point he mentions is that in every one of the cases where an appendicectomy had been done on a roentgenologic diagnosis, the operation had failed to relieve the symptoms. In these patients it is better as he pointed out, to explore the abdomen through a wider incision rather than remove the appendix through a McBurney incision.

In conclusion I may be permitted to point out that in view of the frequency and seriousness of acute

appendicitis, one has to be conscious of the possibility in every case of sudden abdominal pain, and use all methods of evaluation to arrive at an early diagnosis and enable the surgeon to handle the situation early. It is also necessary to educate parents to withhold giving purgatives to children with abdominal pain and see their physicians early.

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RADIOLOGICAL ASPECTS OF APPENDICITIS

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The earliest report on x-ray demonstration of the appendix was made by Beclare in 1906, when he succeeded in clearly demonstrating the bismuth-filled appendix. Since then radiologists all over the world have been trying to study the appendix. They have all expressed their views. There is a great difference in the views, not only about the value of x-ray examination of the appendix, but also about the interpretation of the radiological signs, for instance, significance of appendicular stasis, or of appendiculoliths, of non-visualisation of the appendix or peristaltic movements of the appendix. There is considerable controversy even as to the accuracy of the radiological method of diagnosis, as it has been often made quite freely, based upon variable findings.

The modern view, however, is that diagnosis of the disease of the appendix is primarily a clinical problem to be solved mainly on the basis of the evidence obtained from the clinical history and the physical examination. In all doubtful cases, however, x-ray examination may aid in determination of the cause of the right lower quadrant pain. The diagnosis of chronic appendicitis should be suggestive and the x-ray findings should not be the decisive factor. X-ray findings must always be considered together with clinical manifestations, before a final diagnosis is based.

Appendicitis is commonly found, and appendix is frequently suspected, both in hospital and private practice, and the radiologist is frequently called upon to assist in the diagnosis of such cases.

Acute appendicitis cases are, however, not referred to him, and he should not be called upon to assist in the diagnosis of acute appendicitis, which is a surgical emergency. These cases, when in proper hands, rarely ever see the radiologist. In such cases no time can be wasted in an elaborate x-ray examination, and time is of the greatest importance here. Besides x-ray examination by barium meal should never be performed in acute cases. The same rule also holds good for barium enemas. It is entirely a clinical problem. Besides, any excess pressure, even under the control of screening, may force barium into the peritoneal cavity through a perforated appendix. It is, therefore, exceptional to study a case of acute appendicitis radiologically. In such instances, a simple straight film of the abdomen may be taken. It is however in chronic cases that x-ray investigation is of value, where the radiologist is called upon to examine the appendix radiologically and to give an opinion upon its condition.

Before investigating radiologically, it is most important to take a plain flat film of the abdomen to find out the presence of calcified appendiculoliths, renal or ureteric calculi, gallstones, etc. and subsequently perform a barium meal investigation to exclude a gastric or duodenal ulcer, regional ileitis, and even amœbiasis, as they may be probable causes of the right lower quadrant pain.

There is a difference of opinion regarding the significance of appendiculoliths. Some maintain that ordinarily they have no significance, whereas others believe that they are all pathological. There are two types of appendiculoliths, the non-opaque and the opaque type. The transparent types have no significance. The opaque types are significant, and the importance of their early diagnosis is that they result in acute appendicitis, and the cases reported show that the incidence of perforation in these cases is great. The opaque appendiculoliths are usually single, and as they contain a large amount of calcium, they are radio-opaque. When these calculi remain in the appendix for some time, at least long enough to become calcified, the chances for internal obstruction of the lumen are present. As the most frequently mentioned cause of appendicitis is appendicular obstruction, such calcified appendiculoliths might actually block the lumen, obstruct the blood and lymphatic supply, cause gangrene of the appendicular wall, and thus may make the appendix more likely to be perforated. Besides, such calculi are foreign bodies located in the interior of the appendix and favour acute or subacute attacks by obliteration of the lumen. In any case the presence of calculi in the appendix is abnormal and they are an important factor in future appendicitis attacks and they often indicate that there

has been a previous inflammation of the appendix. Therefore it is better to remove such an appendix with stones as rupture or perforation of the appendix may take place or an attack of acute appendicitis may ensue. Cases have been reported in the literature, where such calculi were at first noticed in the plain film of the abdomen, and subsequently the patient developed an attack of acute appendicitis or the appendix perforated. Therefore the first step is to find out the presence of such calcified stones in the appendix, when appendicitis is clinically suspected. When such calculi are seen in a straight film of the abdomen, lateral and stereoscopic views should be taken. As the appendix shows different anatomical positions, the shadow of the calculus may be found anywhere in the right abdomen. Usually however the calculus is found in the right lower quadrant. If the appendix points upwards to the right upper quadrant, the calculus may be mistaken for a gallstone. If it is found in the right lower quadrant at about the level of the right sacroiliac joint, it may be mistaken for a calculus in the right ureter. In such cases pyelography usually settles the diagnosis. There is frequently lamination in such appendicular calculi. If the appendix is movable, the calcified shadow may move with the appendix. In such cases 2 conditions have to eliminated, they are stone in the right ureter and calcified lymph gland. Usually stone in the right ureter and calcified gland lie nearer to the spine than appendiculoliths, which are usually observed nearer to the right iliac fossa.

The plain examination also detects stone in the right ureter or gallstones, both of which can explain pain in McBurney's point. A diseased gallbladder, low in position, even without stones may similarly be the cause of pain. Frequently one finds lesions in the gallbladder in connection with appendicitis.

Then stomach and duodenum should be examined with barium meal as rarely tenderness in a McBurney's point may be actually due to a gastric or duodenal ulcer in a ptotic stomach. This study of the stomach and duodenum is necessary, not only because it may explain pain in McBurney's point, but also because many patients attacked by appendicitis also present gastroduodenal lesions. The physician frequently refers a case for diagnosis for a query duodenal ulcer, query appendicitis. One frequently finds both duodenal ulcer and chronic appendicitis radiologically. This investigation should be further carried out to exclude organic disease of the ileum, regional ileitis, or of the cæcum. The cæcum should be examined at the repeated screening of the appendix. Lateral view of the cæcum is absolutely essential to show a retrocæcal cæcum. Such lateral examinations are often necessary as they are the only means of obtaining a view of retrocæcal appendix so frequent in ptosis of the cæcum. Even a mobile cæcum may be the cause of pain in the McBurney's point. X-ray examination of the appendix would be incomplete unless it includes a careful examination of the urinary tract, biliary tract and the digestive system. In the present state of our knowledge it is advisable for us to accept as necessary the studies of these tracts when a chronic appendicitis is suspected because lesions of organs other than the appendix are either confirmed or ruled out.

For the last few years, there is considerable confusion regarding the value of x-ray examination in the diagnosis of appendicitis, not only among surgeons and physicians but also among radiologists themselves. Some authors believe that the only sign of value in the x-ray examination is localisation of pain over the tenderness and loss of mobility. I am one of them. Others dispense with the x-ray examination in the study of chronic appendicitis. This tendency is greater among surgeons.

When one has excluded calcified appendicular stones, ureteral calculi, gallstones, gastric or duodenal ulcer, the next step is to visualise the appendix by getting barium into it either by barium meal or barium enema. This is sometimes quite easy but at other times it is very difficult. At times even after 2 or 3 repetitions of barium meal by various technics, the appendix cannot be coaxed to fill, in which case it is extremely difficult to say whether the absence of visualisation means presence or absence of appendix pathology.

In visualisation of the appendix, barium meal given is superior to the barium enema method, although even here there is a difference of opinion, radiologists mostly prefer barium meal method, but some physicians and surgeons insist on using barium enema for visualisation of the appendix. Frequently a request is made for examination of the colon by barium enema in order to visualise the appendix, and occasionally the appendix may be demonstrated in this way, but this is not frequent in my experience. The barium does not remain sufficiently long within the cæcum (at least not long enough like barium meal) to creep into the appendix to permit its visualisation. One is, therefore, not justified to assume that failure of visualisation of the appendix by barium enema necessarily indicates that there is obliteration of lumen or that the lumen is stenosed.

Not only this, but barium meal has other advantages over the barium enema method. Firstly organic gastric or duodenal lesions (ulcers) can be excluded by the barium meal, secondly ileal and gastric stasis, supposed to be reflex auxiliary signs of chronic appendicitis may be found if present. Thirdly the cæcum in barium meal is not so greatly distended as in barium enema, so that study of the appendix by barium meal is easier, whereas in barium enema, the cæcum distends so greatly that it may mask the appendix, thus the study of the appendix would be rendered very difficult. Fourthly, if the enema fluid should enter the ileum (and it does so frequently), and flood the ileal coils, these distended ileal coils may also mask the appendix.

The barium enema method is useful only when the appendix fails to visualise with the barium meal, or when one desires to test whether an irregularity of lumen is constant in both meal and enema. But the real value of barium enema is usually in the appendix

abscess. A barium meal may fail to reveal the appendicular abscess mass, but a barium enema may show a characteristic classical x-ray picture of an appendix abscess.

There are various methods of filling the appendix by barium meal, such as Cambie's Gotteiner's, Czepa's etc. The simplest is Cambie's technic, where the patient is given barium meal, and three hours afterwards, he is asked to take half an ounce of epsom salt in a wine glass of warm water. It sometimes fails to fill the appendix, that is the disadvantage, but in the majority of cases the appendix is more likely to fill by Cambie's technic, as magnesium sulphate encourages appendicular activity and peristalsis. The danger of epsom salt in these cases is there, but usually the cases referred are doubtful cases. I use the Cambie's technic where the physician or surgeon recommends it, where a small dose of epsom salt can be taken. In some cases the surgeon has forbidden the use of epsom salt, here Cambie's technic is dropped, and the appendix is investigated simply six or eight hours after barium meal. In majority of such cases appendix fails to fill, and then it is extremely difficult to say whether there is or not any pathology. With Cambie's technic, the patient is examined 6 hours, 9 hours, 24 hours, 48 hours and even 72 hours after barium meal, if the cæcum and colon are not empty. Often the appendix does not visualise in 6 and 9 hours observations, and visualises first in the 24 hour observation.

Both films and fluroscopic study are advisable. In any case, the fluroscopic study is absolutely essential, as it detects 2 important findings, on which the radiological diagnosis is based, namely tenderness and fixation. The study of the appendix is best conducted with the patient supine on his back, in the horizontal position. Then one can separate with gloved hands, the different parts overlapping, and thus bring the appendix into clear relief. An oblique view may best demonstrate a retrocæcal appendix. A Trendelenberg's position may be necessary if the appendix is situated into the pelvis. Then films are taken in the position in which the appendix was best visible in screening. Sometimes the films fail, to show the appendix, although in screening it was clearly visible after manually separating the parts. This is due to overlapping of the different parts over the appendix which were manually displaced during screening.

The radiological diagnosis is based upon tenderness and fixation of a visualised appendix, but suppose the appendix fails to fill. What is the significance then! Some radiologists state that 99 per cent of the appendices if normal should visualise after Cambie's technic, and failure to visualise after it is said to be suspicious of chronic appendicitis. But this is not quite true, as we now know that an appendix fills and empties, and it is just possible that the appendix may have filled before and again emptied at the time of x-ray examination. The failure to visualise at the time of examination does not mean that it did not fill before. Failure of visualisation must be therefore interpreted in the light of these observations. Cambie's technic has also its disadvantages. Sometimes one finds that the barium meal is hurried, and at the time of fluoroscopic examination there is an empty cæcum and colon and the appendix is not visualised. That means re-investigation and a second barium meal.

Therefore, non-filling of the appendix, unattended by tenderness in the appendicular region, simply because it was not seen on one or two occasions, can hardly be taken as meaning that barium never entered the appendix at any time. Therefore, there is no justification of a positive diagnosis based upon it alone. But however when inspite of a very careful examination, and on repeated occasions when we have failed to visualise the appendix, and when it has not been removed, and the appendicular region in the ileocæcal angle is definitely tender then we have grounds to assume that the appendix is pathological and that its lumen is obstructed. A further attempt to visualise it by barium enema and the failure to do so would strengthen the diagnosis of chronic appendicitis.

Before considering the pathology of appendix, just a word about the normal appendix. A normal appendix is usually about three inches in length, shows two to four mms. in calibre, it fills and empties within 24 to 48 hours, is movable freely, may show peristaltic movements and segmentation, and is not tender on pressure, palpation or manipulation, shows no referred pain to epigastrium when pressed. It may show any position, may be in the pelvis, may lie to the inner side of the cæcum, may be retrocæcal or subcæcal, or subhepatic or subphrenic or may be even left-sided in cases of transposition or non-rotation of colon.

The X-ray Signs of Appendicitis

The x-ray signs of appendicitis are divided into two classes, one group of direct signs and the other group of indirect or reflex signs. Among the direct signs, the most important is fixation and loss of mobility of the normal appendix. Other symptoms are the non-visualisation of the appendix and the appendiculoliths, both of which were discussed in the previous pages and their significance noted. The other direct sign of some significance is appendicular stasis.

Among the indirect or reflex signs, in this group the most important sign is localised tenderness and pain on pressure over the visualised appendix. The other signs in this group but with much less significance are gastric and ileal stasis, cæcal stasis, colonic stasis or constipation, and ileocæcal and colonic spasms.

Of both the direct and the indirect reflex signs, the most important are only two, and upon whom usually the whole diagnosis is based, they are (1) localised tenderness, (2) loss of mobility of the normal appendix. I have always depended upon these two signs, the other signs are merely auxiliary.

Significance of tenderness—X-ray diagnosis of chronic appendicitis is mainly based upon localised tenderness over the visualised appendix by palpation under the fluoroscopic screen. Tenderness over a normal appendix is seldom found. There is no doubt

that tenderness detected over the filled appendix under the screen is much more important than mere clinical tenderness, over the McBurney's point. Among the radiologists there is hardly any difference of opinion about its value. All agree that under the screen the exact location of pain over the appendix may be made, and thus any other painful sites, that are at least confusing clinically can be excluded. Therefore I consider appendicular tenderness properly observed during screen and exactly located to the appendix as a symptom of great diagnostic value. There is also another significant point about pain and tenderness. Whenever chronic appendicitis is suspected, pain and tenderness either localised to the appendicular region or reflected to the left epigastrium, show that the process of appendicitis is active. The tenderness over the appendix is elicited by deep pressure with one finger over the appendix, and should be obtained with the appendix displaced in various positions. If the appendix is movable, there should be movement of tenderness with the appendix, and again there must be absence of tenderness over the original tender area when the appendix is displaced. Without pain and tenderness localised to the appendix, other signs are not convincing, and without pain and tenderness there is hardly any need for an operation especially if pain is absent when the appendix is moved and palpated. Absence of pain over a visualised appendix on palpation does not justify one in the diagnosis of chronic appendicitis. In children this sign is not as important as in the adults. One here can hardly depend upon tenderness, as usually all parts are said to be tender. When the appendix is rather deep in the pelvis, it is not easy to palpate the appendix. In such a case Trendelenberg's position may be helpful and then tenderness may be exactly located over the appendix. In some there is reflex pain and tenderness in epigastrium when appendix is pressed in the right fossa. In others, the tenderness in appendix is accompanied by increase in patient's nausea.

Having located the tenderness exactly over the appendix, and the movement of tenderness together with the movement of the appendix, the next step is to find out if the appendix is free or fixed. Normally the appendix is free and is movable with the cæcum. This freedom of movement of a normal appendix is of great aid in the differential diagnosis. If on repeated examinations at 10, 24, 48 hours after barium meal one finds the appendix persistently fixed, and immovable there is no doubt that it is pathological, and one should then suspect the presence of adhesions, probably fixing the appendix in a definite position. Therefore when the appendix appears immovable, one should try to move the appendix gently, certainly not vigorously. At the same time, an attempt should be made to find whether a part of the appendix is fixed, or the entire appendix is fixed, and to find out whether the appendix is fixed along the inner border of the cæcum or only at the tip. One may also find that the cæcum is immovable. In presence of adhesions, the appendix may become so fixed, that the position cannot be altered. Such a fixation of the appendix, and particularly of the cæcum, in patients who had appendicular attacks in the past is a sure sign of appendix pathology. Sometimes the appendix lies fixed between the terminal ileum and cæcum. Not only in the films, but also on screening, there would be a marked close position between the barium filled cæcum and ileum, even with firm palpation, so that it would be impossible to see the appendix until the terminal ileum is empty.

There are also other auxiliary signs, but they are not very important. They are appendicular, gastric and ileal stasis. Let us see the significance of appendicular stasis and what role it bears in the diagnosis. Normal appendix usually empties in 24 to 48 hours. Such a retention of barium in an appendix is of no significance if there is barium in cæcum or even in descending colon, the period of stasis is here of no significance. Appendicular stasis is looked on with suspicion only if the cæcum and colon are empty, and there are associated tenderness and/or fixation. The period of stasis is immaterial, whether 48, 72 or 96 hours. The correct stasis is any period over 48 hours, provided that the cæcum and colon are empty. Such a prolonged retention of barium in appendix with cæcum and colon empty should be considered supplementary to the 2 principal signs, and it alone in absence of tenderness and fixation does not justify a positive diagnosis. Such an appendicular stasis over 48 to 72 hours indicates poor drainage, may possibly indicate a latent danger to the patient, even if it does not actually indicate a surgical appendix.

Gastric stasis of over 6 to 8 hours, indicates a pylorospasm, has no great significance in appendicitis. Similarly ileal stasis is not important. Kinks or abnormal angulations are of importance only when the appendix shows a fixed kink on repeated examinations, and in various positions, in order to exclude a simple bending or curve which is common in appendix. In such a bend, manipulation under the fluoroscopic screen may alter the direction of an apparently angulated appendix. In many instances, kinks are erroneously diagnosed by examinations technically badly carried out or by wrong interpretations. Certain congenital abnormalities are looked on with suspicion, for example a very long appendix or a very short appendix or a retrocæcal appendix. They are looked upon as a possible potential source of pathology.

Differential Diagnosis

The main differential diagnosis rests between chronic appendicitis and amœbiasis. One usually excludes a stone in the right ureter, a gallstone in a low gallbladder, a gastric or duodenal ulcer in the preliminary examinations before investigating for chronic appendicitis. Amœbiasis is however a multiple lesion, shows changes in the cæcum, changes in the colon, may show amœbic granulomas, may show associated poor excursion of the right dome etc. Where therefore lesions are present in several segments of the colon, it is a strong evidence against chronic appendicitis. After anti-amœbic treatment, the follow up would show complete restoration of involved parts to normal.

As stated before, acute appendicitis patients are not referred to the radiologist, but occasionally he may be referred a case of appendix abscess with a diagnosis of neoplasm, especially in cases where the history is not accurate. I remember such a case referred for radiological investigation of a lump in the right iliac fossa with the probable diagnosis of malignancy. Usually however appendix abscesses are seen by the surgeon, and properly handled so that they rarely see the radiologist. An appendix abscess is a suppurative process, commonly due to perforation of the appendix, which becomes walled off, forming a mass which may be mistaken for a neoplasm not only clinically but also radiologically, hence it is important to know the radiological signs.

First of all a plain flat film of the abdomen may show, on careful examination, a more or less homogenous shadow, possibly fluid and air level, surrounded by gas filled intestines, in the region of a mass in the right iliac region. Study of such an abscess is more difficult than chronic appendicitis investigation. If there are no signs in a plain film, a barium meal study may reveal the mass or it may fail entirely to reveal it. Either there are no signs, or the signs are too indefinite. In some cases there may be a filling defect in the cæcum, when it may be mistaken for malignancy. Where a barium meal may fail, barium enema may clear up the diagnosis. The opaque enema fluid can be observed to run up the colon until it reaches the cæcum. The cæcum may show a normal filling, an incomplete filling or a filling defect. At this stage, the mass is very gently palpated, and its relation to cæcum and terminal ileum determined. It must be remembered here that filling defect in the cæcum has a marked similarity to that produced by other affections and may confuse one. The filling defect produced by an appendix abscess is usually smooth and crescentic, with possible displacement and elevation of the cæcum and ascending colon. The appendix as a rule is not visualised. Therefore absence of visualisation of the appendix with a mass felt in the appendicular region, a smooth crescentic filling defect involving the inner border of the cæcum with displacement of the cæcum and terminal ileum may be looked upon as suggestive of an appendix abscess, particularly if there is a positive history of appendicular attacks in the past. In some cases, the exact nature of the mass is not possible to be determined, until the abdomen is opened up. Among the common conditions resembling an appendix abscess are filling defects of cancer cæcum, ileocæcal T.B., a retroperitoneal mass or a tumour arising from the pelvis.

Value of x-ray investigation—It first of all excludes all possible causes of right lower quadrant pain such as a calculus in the right ureter, gallstones, etc.

Secondly, if it shows calcified appendiculoliths, in a plain film of the abdomen, the importance of x-ray diagnosis becomes at once apparent, when it is realised that appendicular calculi usually result in acute appendicitis, and that the incidence of perforation in these cases is great. Although the clinical diagnosis is most important in appendicitis, often the clinical signs are few, the history is rather vague, or possibly all signs and symptoms may be subsiding when the patient is first seen. In such cases, the x-ray examination would be most important if it shows calcified or opaque appendiculoiths.

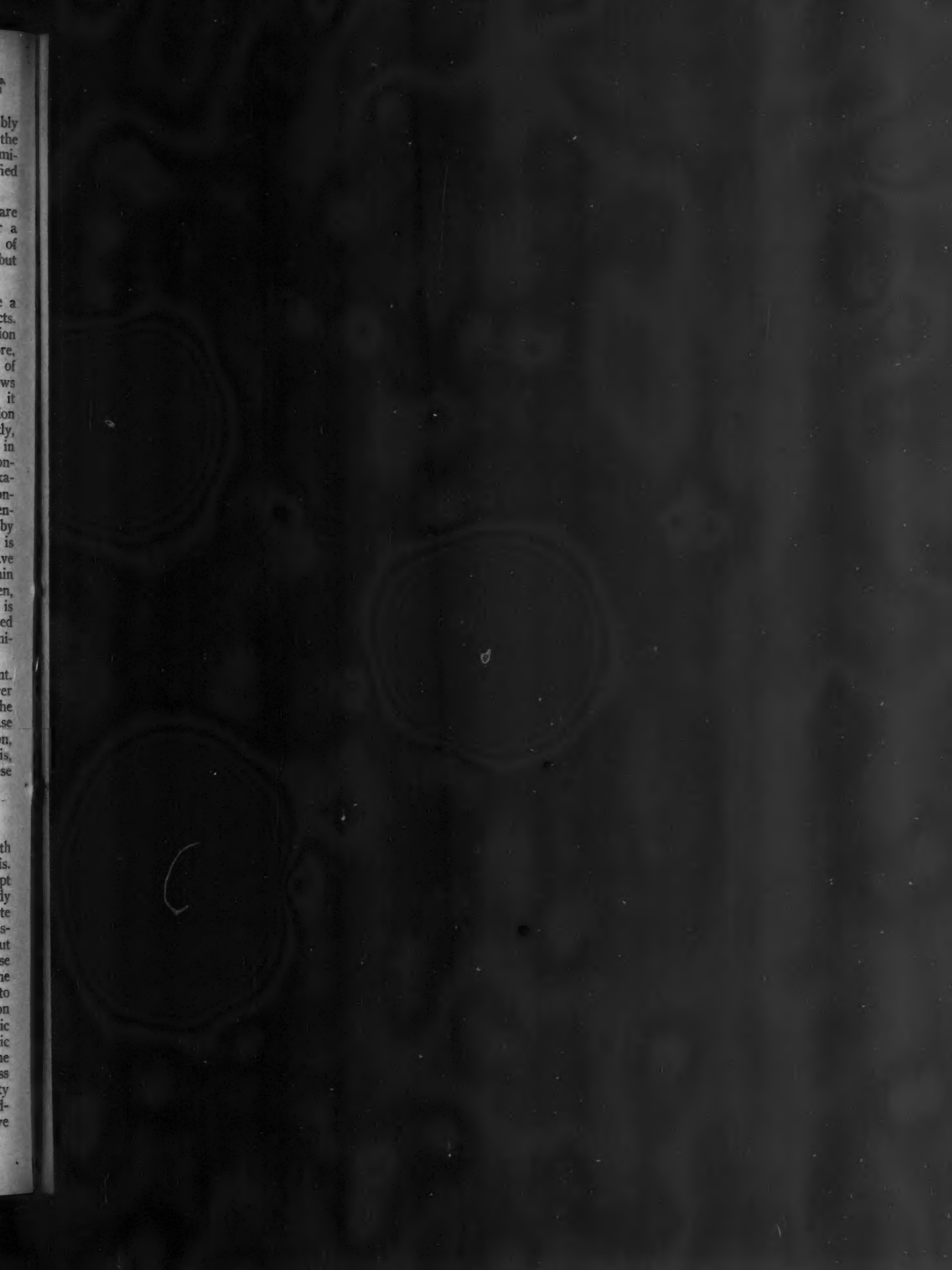
Thirdly, even if no calcified appendiculoliths are visible, the x-ray findings namely tenderness over a visualised appendix, loss of mobility and fixation of the appendix etc. are suggestive of the diagnosis, but are not deciding factors.

But this is not all, as the x-ray findings give a wealth of information to the surgeon in other respects. It discloses anatomical changes, its form, its position whether pelvic, retrocæcal or otherwise, its calibre, shape, and above all the presence or absence of adhesions, its peristalsis, its contents, and also shows whether the appendix is functioning normally or it shows stasis, and for how long. This information cannot be obtained from clinical signs alone. Lastly, the x-ray examination is of great importance in demonstrating a left-sided appendicitis in cases of non-rotation of the colon or situs inversum. X-ray examination is the only method of demonstrating non-rotation of colon. A diagnosis of left-sided appendicitis, made entirely by x-rays and confirmed by surgical operation and pathological examination is rather rare, although a small number of cases have been reported in the literature. In such cases the pain may be in the right lower quadrant of the abdomen, or may be in the left lower quadrant. If the pain is in the left lower quadrant, the case may be suspected to be diverticulitis. In such cases only x-ray examination can clear up the diagnosis.

There is one other point that is quite significant. The x-ray reflex signs as tenderness and pain over the visualised appendix, or pain reflected to the epigastrium on palpation of the appendix or increase in patient's nausea on appendicular manipulation, reflex gastric or ileal stasis, cæcal or colonic stasis, spastic ileocæcal spasms or deformities, all these show that the process of appendicitis is active.

Conclusion

X-ray examination should not be carried out with barium meal or barium enema in acute appendicitis. In our present state of knowledge we should accept as necessary and advantageous the complete x-ray study of the urinary tract, gallbladder, and the complete digestive tract whenever chronic appendicitis is suspected, because such a study confirms or rules out lesions of organs other than the appendix, and these might explain the pain in McBurney's point. The calcified appendiculoliths because of their tendency to be followed by acute appendicitis and perforation should be looked upon as pathognomonic of chronic appendicitis. Evaluation of x-ray findings in chronic appendicitis should be most carefully done and the diagnosis should be based upon localised tenderness over the visualised appendix and upon loss of mobility if any. Such a diagnosis based upon the x-ray findings of tenderness and fixation should be suggestive



and not the deciding factor. X-ray findings in chronic appendicitis must always be considered together with clinical findings before a final diagnosis is made. There is only one way of proving that the x-ray findings justifying a diagnosis of chronic appendicitis were correct, and that the symptoms complained of by the patient were due to appendicitis, and that the operation of appendectomy was beneficial to the patient, and that is the complete disappearance of the patient's complaints after appendectomy.

SUMMARY

X-ray examination by barium meal or barium enema should not be carried out in acute appendicitis. Possible causes of the right lower quadrant pain such as a calculus in the right ureter etc. should be first excluded by a preliminary examination. Calcified appendiculoliths as forerunners of acute appendicitis or perforation of appendix should be remembered. X-ray investigation enables us to visualise the appendix by barium meal or enema. Advantages of barium meal and barium enema and methods of visualisation of the appendix by barium meal are discussed, and value of fluoroscopy in radiological technic is stressed. Significance of tenderness, fixation, appendicular stasis, and non-filling of the appendix is discussed. Differential diagnosis of appendicitis from amœbiasis and features of appendix abscess are discussed. Value of x-ray examination as an aid to surgery is stressed.

TREATMENT OF APPENDICITIS

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To any medical man, whether a physician or surgeon, the ultimate and logical treatment of appendicitis is the removal of the offending appendix. This does not mean that each and every case, as soon as diagnosed, is to be immediately taken to the operation table.

There are certain factors to be considered, amongst them are the previous history, the acuteness of the attack, age and co-existing conditions.

Regarding previous history apart from the characteristic attacks of pain in the right iliac fossa or round about the umbilicus, a history of previous dysentery should always be inquired into and if there is even a suggestion of dysentery having occurred, the stools should be examined. If Entamœba histolytica is found appropriate treatment should be carried out. This sometimes leads to disappearance of symptoms. If symptoms recur operation should be carried out.

The presence of pregnancy of more than three months should be a reason for delaying the operation except in the very acute cases.

The presence of heart and lung disease—except in extreme cases—does not interfere with the logical treatment of appendicitis other than in the matter of the anesthesia used.

Children and old people are very apt to develop the fulminating type of the disease and should be operated on as soon as diagnosed.

It has always been a rule with me not to interfere with an acute appendix, when first seen twentyfour hours or more after the onset, unless the case shows a tendency to get from bad to worse or unless an abscess forms. This attitude has risen from an unwillingness on my part to break up the defences put up by nature and thus opening up a way for cellulitis or peritonitis; and even though I feel, that, with the experience one has gained in the use of sulpha drugs and latterly of penicillin and very lately of streptomycin, one may break up such defences with impunity, yet I have not up to now deliberately opened up an abdomen for an acute appendix which was trying to behave.

I believe that proper preparation saves a lot of discomfort to the patient. In cases of interval appendices the patient is admitted the day before the operation and a dose of castor oil given early. He is shaved from the nipple down to the middle of the thighs. The back is also prepared as for operation except when a spinal is not to be given. He is asked to take a warm bath and when that is not possible the shaved area is well cleaned with soap and warm water. After this the part is rubbed over with turpentine followed by spirit. A ten per cent sulphanilamide spirituous solution containing two per cent iodine is then applied to the skin. The iodine, though immediately effective and penetrating, evaporates or combines with the skin secretions and is rendered ineffective soon. The sulphanilamide then steps in having been deposited as minute crystals and prevents the growth of bacteria. The parts are then covered with sterile towels.

Late in the evening he is given a soap enema. He has light food during the day. I used to insist on the patients eating at least half a pound of glucose sweets during the day. During the war these became very scarce and in some cases they gave rise to much gas formation. I now give 200 c.c. of 25 per cent glucose at the time of the operation, instead.

During the night a sleeping dose is given if the patient is nervous or does not sleep well. Atropine 1/100 grain is given half an hour before the operation in anticipation of a possible general anesthetic. This often makes the patient thirsty during a spinal. He can suck ice during the operation to relieve this.

I operate early in the morning about 7-30 A.M. It diminishes the period of anxiety for the patient and the question of food before operation does not arise.

On the operating table, the house surgeon paints over the shaved area with the iodine sulphanilamide solution. After the towels are applied I paint over the exposed operation area with the same solution.

In emergency operations an enema is given if possible. The parts are dry shaved and the preparation carried through with as little disturbance to the patient as possible.

The anesthesia that I use for appendectomy is practically always spinal. I avoid spinal in cases of

marked toxemia; also in cases with very high or very low blood pressure.

For spinal I use novocain powder. I prepare my own ampoules and autoclave them. I make the puncture in the 4th or 3rd lumbar interspace, most frequently in the former. The injection is given with the patient sitting up across the operation table. The patient is asked to arch his back so as to make the spinous processes prominent. In fat people with large bellies this is not easy and in such, one has to be guided by the feel alone. In these cases a further difficulty is often encountered namely an almost solid œdematous thickening over the spines which obscures them further. It then becomes a matter of luck whether you strike an interspace or not. If after two or three attempts you do not succeed, it is best to abandon the spinal and give the patient a general anesthetic. Another difficulty that arises is, with nervous patients who flex the spine laterally. One has then to compensate for this, by pointing the needle to the side to which the spine is flexed. If one tries to keep at right angles to the midline in these cases one is apt to miss the spinal canal altogether. Another important point during spinal puncture is to keep the chin firmly *pressed* on the chest. This raises the intrathecal pressure and ensures a free flow of C. S. F. I use stainless steel needles about 3½" long and about 20 S.W.G. in thickness. They have a fluted handle and are fitted with a stylet. The point has a short bevel.

After one feels the needle puncture the theca, the stylet is withdrawn and 8 c.c. of C. S. F. is drawn up in a syringe. The syringe is then detached and another needle is attached to it. The needle in the spinal canal is meanwhile plugged with the stylet to prevent loss of C. S. F. The 8 c.c. of fluid is mixed with the novocain. Each c.c. of this mixture now contains ¼ grain of novocain. I use 5 c.c. of the fluid or 1¼ grains of novocain. This ensures anesthesia of more than an hour's duration. Very rarely the spinal anesthesia fails in which case a general anesthetic is given. Sometimes the patient is nervous and even though he has no pain, fusses about the tactile sensation which is not lost. Here again a general anesthetic to the point of inducing sleep is administered. When the spinal is given in the 4th space the patient sometimes feels a crampy sensation in the epigastric and cardiac regions when the cæcum is pulled out and the mesentery is dragged upon during operation. When severe it can be relieved by injecting 10 c.c. of 1 per cent novocain in the ileocæcal angle. This sensation almost never occurs when the injection is given in the third lumbar space.

While on this subject I may say that some patients complain of pain in the lumbar region for a few days after the operation. How much of this is due to the spinal and how much to lying down it is difficult to say. I should think that mostly it is due to the position, as it is very much relieved by massage. Very rarely, there is a complaint of pain in the region of the puncture for weeks or even months after the operation. The movements of the spine are not impaired in any way. I should think that these are cases of "mental fixation".

Transient headaches for a day or two occur in about 20 per cent of the cases. These are relieved by aspirin and in persistent cases by an injection or two of adrenalin ½ c.c.

There was only one case out of more than 3000 spinal punctures, in which, after a week a headache which was very severe came on. As it did not get better within forty eight hours by the usual treatment a spinal puncture was made and a turbid fluid withdrawn. On examination the fluid was found full of polymorphs. There was no bacteria. There was no rigidity of the neck. No temperature. After puncture the headache got better and better and on the fourth day disappeared. A second puncture on the 3rd day showed the fluid practically clear.

I have seen no cases of paralysis after spinal except in one case where the injection was given between the 12th dorsal and 1st lumbar. In this case the paralysis appeared in one leg immediately after the operation and cleared up about six months later. I suspect that the spinal cord was punctured here.

I have had four deaths amongst all my spinals. Two cases were toxic in whom a spinal should not have been given and two were young men, probably unsuspected cases of myocardial degeneration.

It is our routine to give 200 c.c. of 25 per cent glucose in all cases of spinals during the operation. Coramine is administered as a precaution in almost every case. Oxygen is given if the blood in the wound shows cyanosis or if there is sluggish bleeding. The pulse and the tongue are constantly watched. The patient is encouraged to take deep breaths during and after the operation.

A paramedian incision about 3 inches long with its top about level with the umbilicus is used. I have never been keen on the McBurney incision. Even though the latter can be extended if necessary, it is never so facile as the paramedian. The rectus is retracted laterally after separating it from the linea alba. All bleeding points are ligatured. The peritoneum is opened as far out laterally as possible. After all these years and after more than 1500 operations for appendicitis, only last week I unfortunately knicked the small bowel while opening the peritoneum. It was a patient with a large amount of subcutaneous fat and practically no subpertioneal fat. An attempt at spinal had been given up and the patient was under general. Appropriate measures were taken.

The finger is passed in, and the appendicular region is felt. If there is any induration or any mass felt the case should be treated as a septic case. And the area round about the appendix should be packed off with roller gauze or narrow abdominal towels. In cases where there is no induration or mass, in other words in cases called "interval appendix", the finger locates the cæcum and hooks it out after invaginating its wall under the anterior tenia. In most cases this is easy. In other cases the cæcum is high up in which case it is not so mobile. In still other cases even

though normal in position it is fixed to the posterior wall. In some others even though the cæcum is mobile the ascending colon is abnormally fixed and the appendix has a paracolic or retrocolic position. In all such cases where delivery of the cæcum and appendix and particularly the approach to its tip is difficult it is very much better to extend the abdominal incision upwards and mobilise the colon by incising the peritoneum lateral to the colon rather than tug and pull at the cæcum and colon, thus unnecessarily traumatising it and making the operation difficult and the convalesence painful.

Having thus delivered the cæcum and portion of the ascending colon the appendix is released of any adhesions there may be. In doing this great help is derived by holding the fat in the meso-appendix near the tip with an artery forceps. The tip of the appendix should never be caught hold of with a forceps. In cases where there is a marked kink in the appendix a blood vessel of some size is found holding the angle down. After cutting this vessel the appendix straightens out. With the paracolic and retrocolic appendices there are numerous small vessels along either side of the appendix. Most of these can be cut with impunity but occasionally a vessel may have to be picked up. These appendices when released show the usual arrangement of a main vessel running to the tip with branches coming off in between. Of course in these cases there is no peritoneal covering to the vessels. In either case once the meso-appendix or the vessels are free, a ligature is passed through the meso-appendix as close to the base of the appendix as possible. For this purpose I use a Cleveland forceps. Any other forceps can be used. The meso-appendix is then cut through about ¼" beyond the ligature. The appendix is now quite free and sometimes bleeds from vessels derived from the cæcal walls. It also is ligatured as close to the base as possible. Formerly I used to crush the base of the appendix before ligaturing it but in one case the appendix which was apparently not inflamed was cut through by the clamp, leading to soiling of the wound and a subsequent abscess in the abdominal wall. Since then I have never crushed the appendix.

In some rare cases the disposition of the vessels is such or the adhesions are so marked that it is not easy to release the appendix. In such cases the vessels are clamped and cut portion after portion thus releasing the appendix bit by bit.

A purse-string stitch is now passed at least ½" away from the base of the appendix and the first loop of the knot of the purse-string is now made but not tightened. The appendix with its ligature is now held vertically and two four-fold pieces of gauze are arranged around the base so that the whole field of operation is excluded. The ligature on the appendix is next laid down and the appendix held but not clamped ½ an inch distal to the ligature by an artery forceps. The appendix is then divided between the forceps and the ligature by a scalpel dipped in pure carbolic. Before it is completely divided the mucous membrane in the proximal stump is well cauterised by the point of the scalpel dipped in carbolic. The pieces of gauze are now used to mop up any excess of carbolic. The stump is held by a non-toothed dissecting forceps and invaginated and the purse string tied up after cutting the ligature. After making sure that there is no bleeding anywhere the cæcum is returned into the abdomen. In women, the uterus and appendages are next examined and any abnormal condition dealt with, enlarging the incision downwards if necessary.

Finally the omentum is drawn down over the cæcum and the abdomen is closed in layers.

In closing the wall I pay particular attention to the following:—

In stitching the peritoneum the posterior rectus sheath in the upper part and the transversalis fascia in the lower part should be picked up with the peritoneum. It sometimes happens that under general anesthesia, when the patient is not properly under or when the spinal is passing off, the peritoneum retracts widely and tears when the ordinary continuous suture is used; in such cases a recurrent mattress stitch is useful. The use of blunt hooks to lift up the wall at either end of the peritoneal incision is also useful in such cases.

I believe in leaving things as they were and I always approximate the rectus to the linea alba by one or two stitches. There is nothing special about the anterior rectus sheath, except that in all my continuous stitching I use a double lock. This ensures that if for any reason the stitch gives way the whole suture does not relax. I always approximate the fat by two or three stitches of non-chromic catgut. The skin I approximate now-a-days by a subcuticular stitch in aseptic cases. After passing this stitch I work it to and fro so that it can be removed very easily afterwards. It is much better to do this while the patient does not feel it rather than do it afterwards when the patient will suffer unnecessarily. For this suture I have used nylon, silkworm gut and even catgut. Of all these I prefer nylon being the smoothest and not liable to fray like silkworm gut. Catgut need not be pulled out afterwards but is liable to cause irritation.

After suturing, the wound is sprayed with 10 per cent sulphanilamide in methylated spirit, covered with gauze and the subcuticular stitch tied over it. Another layer or two of gauze and then cotton wool for the wound and over the anterior superior spines and finally a bandage. I use a four tailed bandage and not a many tailed one. It is more convenient and not so confusing.

The patient is then removed to his bed. No pillow is allowed for at least two hours. He can have sips of water or ice to suck or even tea or coffee if he feels like it. The hips and knees are slightly flexed. Morphia ¼ grain is given if the patient complains of much pain. 75 per cent of cases require it. About one-third vomit either on the table or afterwards. Persistent vomiting is most unusual. If the vomiting presists beyond eight hours, glucose 25 per cent, 200 c.c., is given intravenously, in case chloretone, acid hydrocyanic and soda bicarb have not checked it. If this does not help, the stomach is washed out.

The patient is encouraged to pass urine within a few hours of the operation. If urine is not passed

within six hours, urotropin grains 15, is given every hour for three doses to produce an irritating urine. Carbachol injection is given half an hour after the last urotropin dose. If this does not help, a catheter is passed. After emptying the bladder it is washed out with 1/4000 permanganate and before withdrawing the catheter 10 c.c. of 1 per cent aqueous acriflavine is injected and retained in the bladder. The catheter may have to be repeated 2-3 times.

The patient is propped up in bed after three hours. Formerly I used to confine the patient strictly on his back. Now-a-days I allow much latitude of movement particularly assisted movement even upto turning on his side. The patient may move his legs and arms. I see no sense in nurses or friends forcibly holding down the legs and arms when the patient tries to move them. There is a greater strain on the wound when the patient tries to move the limbs against resistance.

The patient is always encouraged to take deep breaths in order to keep the lungs clear.

The temperature shows a rise on the evening of the operation, usually not exceeding 100°. If there is temperature in excess, I now-a-days start him on penicillin 100,000 units three times a day intramuscularly and sulphadiazine sodium 20 per cent 4 c.c., morning and evening in 20 c.c. of glucose 25 per cent intravenously. The temperature in most cases is due to deep-seated infection of the lungs, yet nothing may be heard on auscultation. These injections are usually necessary for 3-4 days by which time the temperature returns to normal. The temperature—except in rare cases—is not due to wound infection as there is no swelling, pain or tenderness to be found in the wound.

In those rare cases where there is wound infection it is best to partially withdraw the subcuticular stitch and open up the suspected portion of the wound with a sinus forceps. These days with the treatment above outlined infection subsides rapidly.

The morning following operation a strong soap water enema is given. This leads to the expulsion of any gas present in the bowels and makes the patient comfortable. Light food can be given on the second day.

On the 3rd day of the operation castor oil is given. If the bowels do not move within 6 hours of its administration mag. sulph. in one drachm doses dissolved in one ounce of water is given every hour for four hours. If there is no movement at the end of that time an enema is given. Once the bowels have moved well the patient is very comfortable and hardly knows he is operated on, except when he laughs, coughs, sneezes or makes a sudden movement. Full diet can be given after the bowels have moved well.

Ileus hardly ever occurs in aseptic cases. I dress my cases every other day. The stitches are removed on the 8th to 10th day. The patient is allowed to turn on his side by himself on the 12th day. He can sit up on the 13th, get out of bed on the 14th, and walk about and walk out on the 15th day of the operation.

Coming now to those cases that are acute, being cases that are operated on within 24 hours, or those cases that have developed an attack during the twenty four hours they have waited in the hospital or nursing home but excluding cases of perforation and peritonitis.

In such cases after incising the peritoneum and introducing the finger in the peritoneal cavity the appendix can often be felt as a finger-like induration. In other cases it is obscured by the cæcum and colon, and in more advanced cases by the small bowel and omentum. It is always best to see exactly what one is doing and therefore the incision is extended about an inch or an inch and a half upwards or downwards or both ways, depending on the relative position of the appendix and the original incision. The appendix or the mass is now isolated by packing roller gauze or narrow towels all round. The rectus and peritoneum are retracted strongly to the lateral aspect. Before disturbing the inflamed area I sprinkle and rub in sterile sulphanilamide powder, all over the exposed area including the abdominal wound. Small abdominal towels are arranged over the lips of the abdominal wound to protect them from contamination as much as possible. Ideal material for this is 1/32" thick para rubber sheeting. I used to use this but during the war and since it is not obtainable. Batiste, jaconet and such materials are not as good because any perforations in them caused by the teeth of forceps do not close up and the one property for which they are used namely impermeability is lost. With rubber any such perforation automatically closes up. With good retraction and under good illumination the appendix is released and removed. Any small quantity of pus or serum is mopped up. It does not need a suction apparatus though there is nothing against it being used. In fact if the quantity of material is appreciable, suction should be used. In these acute cases mobilisation of the cæcum should not be done more than is absolutely necessary for releasing the appendix. As the wound is larger, all manipulations can be done inside the abdomen. The purse-string is not a success in these cases as the cæcal wall is stiffened and is friable as a result of participation in the inflammation and the circular folding up is difficult. In these cases the stump is buried by a continuous Lembert stitch. After a final mopping up followed by a generous application of sulphanilamide powder to the cæcum and abdominal would, the wound is closed, interrupted stitches being used for the skin. No drainage is used.

In the after treatment the patient is straightaway put on penicillin and sulphadiazine and glucose 200 c.c. 25 per cent is given morning and evening. In practically all cases there is no trouble and the patient is out of danger by the 4th day. Rarely trouble develops and the cases are then treated on the same lines as those of generalised peritonitis.

Cases that are seen with an abscess already developed are dealt with by an incision over the abscess sufficient to drain it; no opening up of the abdominal wall tissue planes is advisable. After separating the muscles and before opening the abscess, the wound is smothered in sulphanilamide which is well rubbed in. The abscess is drained. The appendix is not searched for. The drainage tube is left in till the discharge

diminishes to vanishing point. Coincident treatment with penicillin and sulphadiazine is carried out. I have been fortunate in not coming across any residual pelvic pockets so far. The appendix is dealt with three or four months later. It is surprising to find that in most cases there are no appreciable adhesions even after large abscesses.

We now come to those cases in which the infection has already spread to the peritoneal cavity to a greater or lesser extent. There is rising temperature and pulse, a dryish tongue and rigidity in the hypogastrium and right iliac fossa even extending to the left iliac fossa. Rarely one comes across a peritonitis so extensive that rigidity has reached to above the umbilicus and there is distension with marked toxicity. Such cases are hopeless even before we start.

Anesthesia in such cases should be general but must be capable of giving good relaxation when required. A suction pump is a very necessary equipment in these cases.

The incision should be generous. The wound should be treated with sulphanilamide powder before opening the peritoneum. After opening the peritoneum the free fluid should be rapidly sucked away chiefly from the pelvis and right flank. Mopping away with swabs on handles is ineffectual and causes unnecessary trauma to the peritoneum. I firmly believe that the more complete the removal of the fluid the better the prognosis. After as much fluid as can be sucked out is removed the intestines are packed away from the cæcal region and under good retraction the appendix is identified, freed and removed, an assistant keeping the area dry by suction. The less manipulation one does the better. The appendix very rarely is paracolic in these cases. The meso-appendix is usually thrombosed but should always be ligatured for safety. The appendicular stump may be left exposed after ligaturing if there is great difficulty in burying it. After all, the appendix has already done its worst. I believe in draining these cases. A stab drain in the right flank and if necessary, one in left flank and another just above the pubis—being careful of the bladder—going down into the pelvis are usually sufficient. After introducing the drains, smother the cæcal and pelvic regions with about two drachms of sulphanilamide powder distributing it well with the finger. I believe in the powder more than in a solution of the sulpha drugs for local application. A solution gets absorbed or washed out soon; the powder dissolves slowly and acts as a bacteriostatic agent for a very much longer time. The abdomen is then closed after again applying sulphanilamide to the wound. Strip rubber drains are brought out through separate stabs from behind the rectus and from the fat.

After the patient recovers consciousness he is put in the Fowler position as soon as possible. Many of the Fowler beds are not correctly made. The thigh or trunk portion is too short in most. Another thing that nurses will somehow never understand and do is to keep the buttocks of the patients in the angle between the trunk piece and the thigh piece of the bed. You often find the buttocks half way up the thigh piece so that the abdomen is doubled up, the pelvis is not at the lowest point and the breathing is embarassed by the pressure upwards on the diaphragm. The patient is maintained in the Fowler position continuously till the acute symptoms have subsided.

Penicillin is given in large doses, 200,000 units four times daily. Sulphadiazine sodium is also given intravenously twice daily.

The patient can take very little nourishment by mouth. Glucose twenty-five per cent, 200 c.c. should be given at least twice a day.

If the patient gets worse in spite of the above treatment and in desperate cases right from the beginning, streptomycin should be given. I have experience of only four cases where streptomycin was used in conjunction with penicillin. I have not used streptomycin alone. I cannot therefore say how much good it really does.

With the hemolysis going on during toxemia, transfusion of blood is very useful. Apart from replacing blood it acts as a protein food and also is a valuable source of complement. Sometimes the whole picture changes for the better after transfusion. Matching must be very carefully done as rigors and fever certainly mitigate whatever good the transfusion can do. The transfusion can be repeated every day if necessary. At least 250-300 c.c. should be given each time.

These patients are always thirsty. Some nurses are afraid that the patient may vomit if he drinks too much and therefore keep the patient almost parched. The patient should have small quantities of water as often as he wants. If he vomits, it does not matter. It is not due to the water he drinks. It is due to his toxemia. If he rejects fluids frequently it is best to give a saline drip of 9 per cent sodium chloride and glucose 5 per cent, so that he gets at least three litres of this fluid in twenty-four hours.

In highly toxic patients the vomiting is quite out of proportion to the fluids he takes. The congested mucous membrane leads to gastrotaxis and the vomiting is of a coffee-ground colour. In both these conditions Ryle's tube should be passed and retained. The nurse must watch to see that it is not blocked; if it stops dripping for any length of time about 10 c.c. of water should be injected through it to clear the passage. I have retained a Ryle's tube continuously for as long as five days. In passing, I must mention a thing I have sometimes noticed, and that is that I have seen the Ryle tube trying to empty in a kidney tray placed near the shoulder of the patient who is in the Fowler position. This is asking too much of the tube. The tube is to empty the stomach and one should see that the delivery is made at a point below the level of the stomach by joining on additional tubing. A wide mouthed bottle tied to the side of the bed is most convenient as a receptacle.

In patients who are toxic, oxygen administration is useful. This should be administered through a number 5 or 6 catheter passed through the nose down

almost to the nasopharynx, taking care not to touch the latter. It should be administered in a steady stream of bubbles and not as sporadic bubbles. Even with a steady stream a 40 cubic feet oxygen cylinder lasts 12 hours!

Cardiac stimulation is best accomplished by coramine every four hours.

In cases of peritonitis, intestinal paralysis is usual. In the early stages a flatus tube helps. I do not believe in the ritual of dipping the tube under water and watching the bubbles pass out. However many or however few the bubbles may be, the most important point is whether it relieves the patient. The flatus tube should be passed without disturbing the Fowler position. It should be kept in for at least fifteen minutes. It should not be passed too often. About twice is good enough.

If there is no relief with this then an enema should be given. I believe in a strong soapy solution with half an ounce of turpentine and two drachms of fel bovinum if available. After all, an enema acts by irritation and the patient should have an enema that irritates and not just tickles. With the latter kind, the water is likely to be retained and make the patient more uncomfortable than he was before. The enema is assisted by carbachol or prostigmine given while the enema is being administered. If unfortunately the enema is retained, a flatus tube should be passed to drain away as much as possible. During the administration and action of the enema the patient should be disturbed as little as possible from the Fowler position.

If in spite of all measures taken to empty the bowels mentioned above, the intestinal paralysis increases and the abdomen gets more and more distended, it means that the peritonitis is extending. In such cases carbachol, pitressin, strychnine and arecoline alternating, each every four hours, should be tried. Continuous fomentation of the abdomen either with hot water bottles or better still with an electric pad is very useful. As a last measure enterostomy under local anesthesia should be tried.

Chest complications are even more frequent in these toxic cases than in the straightforward appendices; measures taken to treat the abdominal infection are also sufficient to deal with the chest complications.

I must very briefly mention the results. Mortality of an interval appendix is almost nil. Mortality of a perforated appendix varies as to how soon after perforation the operation is undertaken and may vary from 10 to 90 per cent. The introduction of the sulpha drugs and penicillin have markedly affected the prognosis for the better, so much so that the old and the new figures cannot be compared.

Most patients are relieved of their symptoms after operation. Some go on complaining about the pain in the right iliac region and of marked tenderness over the cæcum. These are mostly cases of mistaken diagnosis where even though the symptoms pointed to appendicitis yet an appendectomy was not necessary, but we are wise after the event. In some cases the persistence of the pain is due to adhesions. In others it is due to an undiagnosed stone in the ureter, or to persistent Entamœba histolytica infection. Very rarely there is enteroptosis. Pelvic trouble in women may lead to persistence of symptoms.

Some patients, particularly of the nervous type, guard the scar and lean forward in walking, sometimes with a hand supporting the scar. Such patients should be encouraged to disregard the fact that they have been operated on and should be made to walk straight, forcibly if necessary. I remember a young man going to his native place soon after the operation. When I saw him about six months later, he was leaning right forward and walking with the help of a stick. I blustered and straightened him out and made him walk in that position while I was pulling back his shoulders. He was convinced and within a week gave up his stick.

Painful scars are best dealt with by massage of the abdominal wall and scar.

With the paramedian incision, scar herniæ are uncommon. Right inguinal hernia which is supposed to follow injury to a nerve during the McBurney incision cannot arise with a paramedian incision.

One of the most troublesome and exasperating conditions is keloid formation in the scar. They arise even after the most perfect healing by first intention. I have pondered over their causation. I have not been able to come to any definite conclusions. The treatment is by radium or by excision and radium depending on how extensive they are.

This then is the outline of the line of treatment I follow in the different types of appendicular infection. There is nothing original about what I have said. The methods are gleaned from here and there and smoothed out into a routine after buffetings and some bitter experiences. I shall feel I have done something useful if a few of you—particularly my younger colleagues—derive some benefit from a point here and there.

DISCUSSIONS

Dr. Kripa Ram Sud said:—

During diagnosis the following conditions which have not been mentioned so far by any of the speakers on the subject, must be borne in mind:

(1) *Round worm*—a round worm case simulated appendicitis clinically, but vomited round worm just before he was going to be operated; later he was given santonin and passed half a dozen stools and then the mass and pain disappeared.

(2) *Lead poisoning*—lead colic may simulate acute abdominal crises including appendicitis, but you must look up for other symptoms and blue line on the gums.

(3) *Cases of gonorhœal salpingitis*—in the first attack these cases simulated appendicitis but careful history of the case and treatment spared her the operation but left her with sterility.

(4) *Cases of tubercular salpingitis*—in female should be borne in mind.

(5) *Ectopic gestation*—with mass in abdomen may be missed and diagnosed as appendicitis if it occurs on the right side.

He stressed that rise of temperature and increase of leucocytes are criteria for diagnosing appendicitis which may be present without the above two findings. Their presence may mean any other inflammation in the abdomen and the chest and absence does not exclude it.

(6) One case of *tabes dorsalis* was also seen with abdominal crisis; hence the importance of examination of the central nervous system expecially the knee jerk and Argyll Robertson pupil, examination of blood and cerebrospinal fluid for syphilis.

Dr. V. R. Balwe, b.sc., m.b.b.s., capt., i.m.s., reported the following case of recurrent appendicitis (5 attacks) :—

In January, 1942, an I.M.S. Officer, commanding 100 bed-hospital at Tobruk got a typical attack of appendicitis. He kept himself on fluids and recovered in about a week. The second attack occurred in July, 1942 and by keeping himself on water and fluid diet the attack was aborted.

Similar attacks came on in September, 1943 and February, 1944. Every time the officer stoutly refused operation being confident of aborting the attacks in the usual way.

In March, 1944 he was admitted on 16th—under Dr. A. V. Baliga, f.r.c.s. in K.E.M. Hospital, Bombay.

X-ray examination showed filling defect and excluded other conditions. Stools showed cysts of *Ent. histolytica*. The patient was put on a course of emetine hydrochloride and carbarsone.

On operation—a distended appendix with hour glass contraction was removed. The case made an uneventful recovery and was discharged on 8th April, 1944.

Dr. M. R. Cholkar, l.m.s. (*Nagpur*) gave two instances of small incision resulting in uncontrollable bleeding, one ending in death.

He told the house that in Australia which he had visited recently the operated patients were allowed to walk after 24 to 48 hours.

Dr. V. B. Davalbhakla, m.s. (*Jalgaon*) said:

With regards to x-ray diagnosis, I wish to stress that, I never advise it as a routine. In very doubtful cases a bland x-ray with barium enema is taken. In that case during serving I rely only on the presence or absence of local tenderness and amount of mobility of the filled appendix. It is useful in detecting renal or biliary calculi.

If Dr. Moolgavkar will kindly say, if he has not found injection of anti-gas gangrene serum just after operation to prevent the serious complication of post operative ileus. In my experience it is most useful with or without injection of penicillin.

Dr. H. G. Weiss, m.d. (*Swanville Ind. U.S.A.*) said:

It is indeed a great privilege for me to be permitted to attend the All-India Medical Conference.

I have most throuoghly enjoyed the paper and discussions during the past two days and especially the sense of humour exhibited occasionally. With your permission I wish at this time to extend to the medical profession of India the felicitations of the medical profession of the United States of America and the greetings of the American Medical Association to the All-India Medical Conference.

The subject of appendicitis has been of great interest to me for many years, having been permitted to study and practise medicine at a time when it was first recognized as an entity or a definite disease, at a time when it was still spoken of as typhlitis or perityphlitis, at a time when few cases were operated and when operation was done in such a manner and the post operative treatment was such that the mortality was so high that operation were done as a last resort which in turn increased our mortality. I well remember when we first began to use the Murphy's drip and the Fowler's position postoperativily with a reduction of postoperative mortality; also when we began to recognize the value of early operations and the cases that should be deferred, when we began giving intravenous saline and glucose postoperative mortality again became lower and again when we began using Levine tube and Wanguestine gastric and duodenal drainage and decompression. I was surprised and greatly interested when I saw on your programme a symposium of appendicitis.

Between 20 and 30 years ago one of our eminent men in medicine, Dr. Chas. Emmerson, Dean of the Medical Department of Indiana University, the University of my home State, visited the orient for the purpose of making observations. On his return in his lectures, he often spoke of the cases of appendicitis he saw in the orient in comparison to those seen in the United States. He at the time attributed our many cases of appendicitis in comparison to what he found in the orient to faulty functioning of our autonomic nervous system as brought about by our more intense faulty method of living. Early diagnosis and early operation have possibly done more to reduce the morbidity and mortality of appendicitis than all other measures before the introduction of the sulphonamides and penicillin which introduction, we all agree, has entirely changed the picture of appendicitis and its treatment.

The pendulum has possibly swung too far in the direction of operation and many appendices have been removed that were innocent. At one time this tendency was recognized by the American public and the medical profession caricatured by the Press and the

appendix called the 'gold mine' of the ambitious surgeon. But I believe it is agreed by our profession that the removal of an innocent appendix is the most pardonable of all unnecessary operations and that it is better practice to remove two normal appendices inadvertantly than to permit one to rupture.

Dr. S. C. Sen, (*Delhi*) asked if penicillin cures acute, subacute and chronic appendicitis, without recourse to operation; if surgeons in India allow cases of abdominal operation to get up and about after 24 hours as it is supposed to make convalescence more comfortable and recovery rapid. In addition to what Dr. Daboo has said, it is necessary and advisable, to get stool examination done in every case of barium meal examination—specimen to be taken after saline purge and collected from the 2nd or 3rd motion. It may be necessary to examine a bowel wash and centifugilised specimen.

In case of women gynæcological examination is necessary to exclude lesions of the tubes and ovary.

In case appendix has not been visualised, it is necessary to repeat the barium meal 3 or even 4 times.

Regarding diagnosis of acute appendicitis, I may mention the story told by the late Mr. Finney about the case of acute appendix he operated upon which turned out to be a case of chicken pox.

In 1,500 cases of post mortem, apparently normal appendices, without any previous history of appendicitis, were found to be pathologic according to laboratory report.

Dr. A. N. Roy (*Calcutta*) said:—

Complement fixation test of serum for diagnosis of chronic amœbiasis is important. Some cases have been done by us and cases revealing the presence of *Ent. histolytica* in stool have given positive results. Surgeons attached to big hospitals with laboratory equipment may kindly take recourse to this test. One good advantage is that serum can be sent to the laboratory. A differentiation can be made between amœbiasis and appendicitis with this test.

Dr. R. C. Sen (*Calcutta*) stressed on the following points: (1) appendicular spasm; (2) trauma, direct and indirect and acute visceroptosis with movable cæcum; (3) value of blood count with respect to surgical measures—leucocytosis by itself should not be the criterion for diagnosis unless Schilling count shows marked excess of stab cells.

Regarding treatment he suggested: (1) emetine hydrochloride and col. calcium 1 c.c. injection, (2) sterodin injection, (3) penicillin and (4) antigasgangrene injections.

The following doctors also participated in the discussions:

P. P. Sheth, M. K. Parikh, S. S. Mehta, S. R. Raja Ram, M. S. Wagle and R. V. Mahashar.

ARTIFICIAL FEEDING OF INFANTS WITH CHEAP INDIGENOUS FOODSTUFFS

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The following is a small contribution to the problem of feeding India's millions. Not that I feel myself qualified to give any expert advice as to how to feed the working and striving multitude of this country's population, I fully realise that this problem, in all its terrific and terrifying aspects, is far beyond the strength of an average mortal and certainly beyond my own inclination and capacity.

This paper deals with infants' feeding only.

All I have been searching for was a diet for small children, cheap enough to be accessible even to the poorest, and good enough to prevent, and if possible to cure malnutrition among that youngest section of the population who one day will have to bear the torch of India's destiny.

In order to meet the former postulate, the economic one, such a diet had not only to be cheap, it had to be *very cheap;* in fact, it was realised that the maximum cost of a day's food, was not to be more than 3 to 4 annas. It is no use devising preparations which are not within reach of the working classes who are living, under present conditions, still on an income below Rs. 35/- per month.

As for the medical, esp., nutritional aspect of the question, it had to be solved by trial and experience.

A report on that part of the problem will be given later on in the course of this paper.

Components

In order to obtain a food, rich enough in calories, we decided to add a fat to an otherwise low-caloric butter-milk mixture. As a high nutritional value of the diet was of paramount importance, this problem figured right in the centre of all our considerations.

We had obviously to make use of a fat which is cheap, in ample supply and easily available. Our final choice was sweet oil, Kardi oil or gingelly oil, either of them being harmless, easily digestible and (in the form it was presented) palatable.

Carbohydrates, which are necessary for a balanced diet, especially in the presence of fat, were added in form of jaggery and jowar—attah, both likewise being cheap and in ample supply.

The latter prevents the sedimentation of the coagulated proteins, thus assuring a homogenous mixture. It also acts as the main vitamin carrier of the mixture owing to its contents of nicotinic acid and riboflavine. According to Walters (1941), the Indian vegetarian's intake of these 2 factors of the vitamin B complex depends almost entirely on his atta consumption.

By devising a food of a comparatively high carbohydrate content we followed Göppert and Langstein (1920) who already suggested that the requirements of carbohydrates of a hypotrophic child may be higher than that of a normal child. A similar view is taken by Finkelstein (1940) who states that most patients with dystrophy improved if, without reducing the original amount of milk, sufficient carbohydrate is added.

Unfortunately the tolerance of a dystrophic child to carbohydrates is reduced, and that calls for attention in the preparation of food mixtures. It has to be borne in mind that too high a carbohydrate content may cause abnormal intestinal fermentation and in its consequence dyspepsia and deleterious diarrhœas.

In order to obviate this danger as far as possible we choose as diluting fluid not fresh milk or a milk dilution but buttermilk. The beneficial action of the latter on the gastro-intestinal system has been well-known for a long time, and various tinned buttermilk preparations are available on the market. They are however, expensive and out of reach of the poor.

The protein content of buttermilk acts as an anti-fermentative, and in a similar direction works the lactic acid which prevents the organisms of the B. Coli group from ascending into the proximal parts of the intestines.

The actual recipe of the oil-attah-buttermilk-mixture which we briefly called "OABJ" is as follows:—

(1) 2 oz. Jaggery and 30 grains of Soda bicarb are dissolved in 1000 c.c. hot buttermilk. (The soda bi-carb is added in order to neutralise excessive acidity).

(2) 2 oz. Karadi oil and 1 oz. Attah are mixed and heated until a homogenous, brown paste results.

(3) The butter milk-jaggery mixture is slowly added to the paste and the whole mixture boiled for 1-2 minutes.

By the process of frying oil with attah the lower fatty acids, which are probably harmful, are evaporating, and the mixture becomes easily digestible.

The caloric value of the mixture is as follows:—

Karade oil	per 100 gm. approximately	900	calories
Attah	" " " "	340	"
Jaggery	" " " "	320	"
Buttermilk	" " " "	30	"

1000 c.c. OABJ contain therefore about 1130 calories of which about

540	calories are contributed by	the oil
100	" "	attah.
190	" "	jaggery
300	" "	buttermilk

The mixture contains roughly 30 calories per oz. or rather a little more. In order to appreciate the significance of those figures one has only to remember that the adequate caloric intake of an adult working man is about 2,500—3,000 calories a day, and that under present conditions probably the majority of the population in Europe and this country lives on hardly more than 1000 calories P.D.

Proteins—Buttermilk contains about 3·50 per cent protein and attah between 6 per cent and 8 per cent, so that the need of protein is obviously completely covered by the mixture: one reckons about 2 grammes of protein per 1000 gm. body weight.

The preparation is a light-brown, thick fluid of pleasant taste. As a rule, it contains numerous suspended flakes of casein. As its consistency is rather thick, it has to be given by spoon. Almost all children take it without much resistance. If a child for the first time objects to the unfamiliar taste, it is easy to get it accustomed to the mixture by omitting one meal and offering a freshly prepared one 3 hours later.

O.A.B.J. & Cow's Milk

Before reporting on our results we consider it appropriate to answer the obvious and justified question: "what is the preparation's advantage—if any—compared with other milk mixtures, esp: fresh cow's milk and its various dilutions?" We all know that cow's milk, in proper dilution, is a perfectly satisfactory substitute for mother's milk. Then why a new preparation?

The answer is this:—

Cow's milk is all-too-often adulterated, watered and contaminated, and has in many cases hardly the value of skimmed milk. The result of this deplorable state of affairs, as far as the unfortunate infantile consumers of that sort of milk are concerned, is malnutrition. It was malnutrition that made us devise a new preparation. Cow's milk would be alright if it were of a high quality, and cheap at the same time; buttermilk on the other hand is cheap and seldom, if ever, adulterated.

From the foregoing it will be clear that we saw our task in assessing the value of OABJ diet in the treatment of malnutrition. It was easy enough to find out that the diet was well tolerated,—even at long periods,—by the healthy child, that it did not lead to diarrhœa or dyspepsia, and that it was readily accepted. We tried it on some 40 healthy infants and toddlers and found that they all thrived well on the mixture. We also had good, and in some cases surprising, results in the treatment of adults suffering from marasmus or otherwise in need of a fluid high-caloric and high-protein diet.

Case Reports

After these preliminary findings our next step was to try the mixture on children with signs of nutritional deficiencies.

This paper deals with 20 cases of marked malnutrition treated with O.A.B.J.

Our cases were divided, according to their clinical features, into the following 3 groups.

1. Cases of underweight without signs of gross pathology—8 patients.

TABLE—SHOWING DETAILS OF DEVELOPMENT OF CHILDREN UNDER REVIEW

Case		Age	Additional treatment (except Mother's milk which was given in all cases	General condition prior to treatment.	Weight at beginning of treatment	Weight 6 weeks prior to treatment	Weight 6 weeks after beginning of treatment	General condition 6 weeks after treatment commenced.	Feeds OABJ No. of
1	Group—1 (One)	2/12	Nil.	Fair.	7 lbs.	6 lbs.	9 lbs.	Good.	4
2		10/12	Shark liver oil & Fruit Juice.	Fair.	15 lbs. 8 oz.	15 lbs.	16 lbs.	Good.	3
3		7/12	Shark liver oil.	Fair.	15 lbs.	15 lbs.	17 lbs.	Improved.	2
4		10/12	Nil.	Fair.	15 lbs. 6 oz.	13 lbs. 8 oz.	13 lbs. 10 oz.	Fair.	3
5		9/12	Shark liver oil.	Fair.	14 lbs. 12 oz.	14 lbs. 11 oz.	15 lbs. 10 oz.	Improved.	2—3
6		10/12	Nil.	Fair.	15 lbs. 6 oz.	15 lbs. 12 oz.	16 lbs. 4 oz.	Improved.	3
7		5/12	Shark liver oil.	Fair.	11 lbs. 8 oz.	11 lbs. 8 oz.	12 lbs. 6 oz.	Improved.	2—3
8		7/12	Nil.	Fair.	12 lbs. 8 oz.	12 lbs.	13 lbs. 4 oz.	Fair.	3
9	Group—2	10/12	Fruit Juice.	Rather poor.	10 lbs. 6 oz.	10 lbs. 8 oz.	12 lbs.	Good.	3
10		11/12	Fruit Juice. Shark liver oil.	Poor.	11 lbs.	11 lbs. 8 oz.	12 lbs.	Fair.	3
11		9/12	Nil.	Poor.	12 lbs. 10 oz.	13 lbs.	13 lbs. 10 oz.	Fair.	2—3
12		10/12	Nil.	Rather poor.	13 lbs.	13 lbs.	14 lbs.	Improved.	2
13		7/12	Nil.	Poor.	9 lbs. 8 oz.	10 lbs. 8 oz.	12 lbs. 2 oz.	Improved.	2—3
14		1 Yr.	Shark liver oil. One additional feed of egg flipp.	Poor.	9 lbs. 8 oz.	10 lbs. 8 oz.	12 lbs.	Good.	4
15		11/12	Nil.	Rather poor.	11 lbs. 8 oz.	12 lbs. 8 oz.	13 lbs. 8 oz.	Improved.	3
16		10/12	Shark liver oil.	Rather poor.	11 lbs. 8 oz.	11 lbs. 8 oz.	14 lbs. 8 oz.	Much improved.	3
17		1 Yr.	Shark liver oil. Calc: Lact:* Santonine.	Poor.	11 lbs.	12 lbs. 6 oz.	11 lbs. 10 oz.	Improved.	2—5
18		7/12	Nil.	Poor.	9 lbs.	9 lbs.	11 lbs. 2 oz.	Improved.	2—3
19	(Twins) Group 3	10/12**	Multivit: Calc. Lact. Nicotinic acid. 25 mgm.	Extremely poor.	8 lbs. 10 oz.	9 lbs. 6 oz.	8 lbs. 10 oz.	Much improved.	3**
20		10/12**	do.	do.	8 lbs. 4 oz.	8 lbs. 8 oz.	8 lbs. 4 oz.	Much improved.	3**

*Was suffering from severe ascariasis and had a course of santonine treatment.

**Both children were out of danger after 6 weeks, but started to gain weight only after 10 weeks treatment. O.A.B.J. was given after a start was made with buttermilk without oil and a reduced amount of carbohydrate.

2. Cases with signs of wasting—10 patients.

3. Cases of underweight with gross alimentary dysfunction—2 patients.

The age group of our patients was as follows:—

From 1st to 4th month	.. ..	1 child
From 5th to 8th „	.. ..	7 children
From 9th to 12th „	.. ..	10 children
From 13th to 15th „	.. ..	2 children

Dosage of the preparation—No fixed rules could be laid down as for the optimal amount of the preparation to be given in an individual case.

We made it a strict rule to feed the children on mother's milk in the first instance as far as possible. O.A.B.J. was offered whenever it became evident that the patients did not thrive on mother's milk alone, especially when test feeding showed that maternal milk did not cover the needs.

In the cases under review O.A.B.J. was never given to the exclusion of other food, but always in addition to mother's milk. It was offered in small feeds twice to 4 times a day, according to the individual case.

The caloric requirements of the patients were covered by O.A.B.J. in the following percentage:

80 per cent of caloric requirements provided by OABJ—1 child, 50 per cent of caloric requirements provided by OABJ—2 children, 30—40 per cent of caloric requirements provided by OABJ—2 children, 25—30 per cent of caloric requirements provided by OABJ—15 children.

The figures are approximate only as almost all our cases were out-door patients, and we had to depend on the docility and the good will of the mothers concerned.

Results

The main criterion of success or otherwise of our feeding experiment was obtained by a regular check of the weight in all our cases. The children were weighed as often as possible at the Kurduwadi Railway Dispensary. As weight charts were kept of all the infants before and during the feeding experiment a fairly correct impression of how they reacted to the diet, could be gained.

All children were also seen at their homes at least once a week by the health visitor who gave a report in writing on the progress of the patients.

Particulars of the development of all 20 children are shown below:

Cases 1—8 were comparatively mild cases, exhibiting underweight only without other gross pathology. Cases 9—18 showed underweight and wasting and cases 19—20 were patients with additional severe intestinal dysfunction, such as vomiting, diarrhœa, glossitis. Both had an extremely low limit of tolerance, and it was thought rather unlikely that they would survive. These two cases were kept as indoor patients for a while as it was necessary to supervise their feeding strictly.

Two more cases, belonging to the same group, died before treatment on the lines proposed could be attempted.

Discussion

While all cases did obviously quite well on the diet described, no claim is made that this diet is adequate in all essentials.

It will, however, be seen from our table that the number of children getting any additional food together with O.A.B.J. and maternal milk was very small. A few only got fruit juice and one only an additional egg-flip. None got meat, biscuits, rusks or broth. This is certainly not a desirable state of affairs, at least not as children of 7 and 8 months and more are concerned.

As a matter of fact, we made it a rule to advise mothers strongly to add some other food to their children's diet after the 7th month. However, conditions in this part of India are so poor that our instructions could not be followed. Under those circumstances we made the most of what little resources were at our disposal.

A word of warning may perhaps not be out of place in connexion with the 3rd group of our table.

It is impossible to give a child with definite signs of serious malnutrition and alimentary decomposition a rich food like O.A.B.J. right from the beginning. The result would be disastrous. In such a case one has to start treatment with mother's milk only, or if this is impossible with buttermilk with a small amount of flour and saccharine, but without any fat. If a child improves on such a diet it may be possible as it was in our 2 cases, to change over to O.A.B.J. after a short while, but much discretion is necessary to decide when this stage is reached.

Summary

An artificial infants' food of high caloric value has been devised which consists of cheap, indigenous components only.

The mixture has been tried on a number of healthy babies and has then been used for the feeding of 20 infants with signs of malnutrition.

It has proved to be of value in the treatment of nutritional deficiencies.

Acknowledgment

I am obliged to Dr. V. G. Desai, Assistant Medical Officer, Barsi Light Railway, to Mrs. Indira Bai Raste, Health Visitor and Miss D. Fernandez, Hospital Nurse of the Barsi Light Railway at Kurduwadi for their collaboration and keen interest in the work described in this paper.

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SPECIAL ARTICLE

MEDICAL RESEARCH IN INDIA

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Medicine, in its foundations and its applications, is based on research. The most sacred heritage of modern medicine has come through the transcendent genius of a comparatively few men who applied themselves to the difficult task of alleviating human suffering and disease. The modern practitioner is the legatee of this knowledge accumulated through all ages and from all climes and nations. Slowly but surely new facts have been gathered and the structure of modern medicine was built thereon, removing dogmas and empiricism with ruthless strokes. However, medicine cannot have any finality. The problem of disease still faces mankind and a feverish search for newer truths must be always kept up.

If this is the state in which modern medicine finds itself, there cannot be any two opinion that modern medical practitioners must keep themselves alert and up-to-date with all new developments in medical science. Medical science is progressing by leaps and bounds every day and scientific data are collected from laboratory and other technical findings from basic sciences which are enriching the bounds of knowledge of the various fields of medical practice. Simultaneously, medical science is creating a new horizon for other related sciences as well. Truly has medicine been designated as the 'Mother of all Sciences' as it has given rise to many scientific disciplines. It is the innate spirit of enquiry about his own body and his surroundings that prompted man to go for research and investigations into other physical and biological sciences, like Physics, Chemistry, Biochemistry, Mathematics, Physiology, Pharmacology, etc.

Achievements of Medical Research

Only about thirty years ago, a large number of deaths among children from diptheria was a frequent occurrence and medical men used to believe that bad smell from the drains and sewers was probably an etiological factor. Now-a-days the immunization of school children with toxoid has become so well established that a position is in sight in which it may be confidently hoped that this dreadful disease will soon cease to count as a threat to child life of any progressive community. Not very long ago, a case of 'diabetes mellitus' in the wards was viewed with despair by the physician. The discovery of insulin has not only changed that picture but has further opened up a very important and fruitful field of researches on internal secretions of the body in general. During the last twenty years active hormones have been obtained from the parathyroid glands, from the suprarenal cortex, from the different gonads and from the anterior pituitary gland. From liver and stomach mucosa, materials have been extracted the administration of which can restore to the victim of pernicious anæmia the factors missing from his blood-forming system. Insulin has been crystallized, thyroxine has been prepared by complete synthesis, while several of the sex hormones and that of the suprarenal cortex have been obtained as pure crystalline substances, structurally identified, and even prepared artificially by partial synthesis from different sterols. Twenty years ago, who amongst the modern students would have believed that these things even existed? Again, at the beginning of this century our knowledge of nutrition and dietetics was very poor and people talked about proteins, carbohydrates and fats only and there was no idea of the existence of accessory food factors. To-day already seven vitamins have been isolated in pure form, structurally identified and prepared artificially by synthesis. Considerable advances have also taken place in the field of pharmacology and therapeutics and synthetic chemistry has provided innumerable useful medicaments for the chemo-therapeutic attack on a host of diseases of both protozoal and bacterial origin. The discovery of penicillin and similar antibiotics have brought in a new era of hope and before long, diseases such as Cancer and Tuberculosis, would be conquered. All these discoveries convincingly illustrate the way in which medical research is providing new conceptions of etiology of diseases and new resources for treatment based directly upon it. Many of these would not have been possible without experimental research in the laboratories on the one hand and clinical observation on the bed side on the other.

Lack of Interest in Medical Research

Why then is there such a lack of interest and such apathy in this country for promoting medical research? The argument that India is a poor country and has not enough to feed her children properly—not to speak of endowing money for research—is apparently idle and fallacious. There are plenty of Rajas, landlords, bankers, etc., who spend large sums of money in this country and abroad for objects and pleasures which are abhorrent to the cultured mind. We cannot ignore that there are plenty of philanthropists in this country who spend lots of money in private charities and in building temples, bathing-ghats, etc. There are thousands of religiously-inclined Indians who would gladly spend a fortune in undertaking a pilgrimage and for the sole purpose of having a dip into the sacred waters of the Holy Ganges at Hardwar. No, everybody in India is not poor—though it is generally true that India is poor. Paradoxically however, the privileged and the moneyed class in India are generally rich in purse but poor in mental outlook and creative discipline. They seldom understand the motives which guide men in the quest of the unknown and towards "regions yet untrod"—they never care to tolerate, not to say anything of supporting, inquiries which might, for all that we know, lead to nothing but smoke. To a small minority amongst them, human sufferings make an

* Director, Central Drugs Laboratory, Directorate General of Health Services; adapted from an address delivered before the Sixteenth Re-Union of the Carmichael Medical College inaugurating the Scientific Conference of the Session, in December, 1947.

appeal and it must be said to their credit that many of them have come forward with munificent donations towards the building and maintenance of hospitals and out-patients' departments. But there it ends—the final culmination of all philanthropic efforts! What is really the beginning is considered the end of all endeavours. Without new investigations and newer knowledge in medicine, how much can be done in this way? Is it any good to prescribe a sleeping draught to a patient in pain? We are certainly doing him good temporarily, but the real good will only come through finding out the cause of the pain. For this, we must probe into the dark, we must try to snatch the zealously guarded secrets of Nature, we must carry on what is known as "research". In India, practically all the research schemes, especially in the field of medical research, are state-aided and state-managed. The only reason for such neglect of "research" in every field in this country is due to the fact that the true meaning, aims and objects of "research" are not sufficiently well understood.

The ordinary man in the street judges scientific research from the point of view of its direct service to humanity, or that of money-making capacity; and he considers that people who devote their lives to studies having neither of these profitable objectives in mind are wasting their time and abusing their intellectual faculties. It will come as a surprise to most men to be told that in scientific circles usefulness is never adopted as the standard of value; and that even if not a single practical result is reached by an investigation, the work is worth doing if it enlarges knowledge or increases our outlook upon the universe. This proposition, of course, leaves the practical man cold; yet it is all that science desires to offer in justification of its activities. While the discovery of truth remains its single aim, science is free to pursue inquiries in whatever direction it pleases; but when it permits itself to be dominated by the spirit of productive application, it becomes merely the galley-slave of short-sighted commerce. Almost all the investigations upon which modern industry has been built, for example, would have been crushed at the outset if immediate practical value had determined what work should be undertaken. In 1856, a lad of seventeen years of age, William Henry Perkin, set himself the task of trying to prepare quinine artificially. The problem which he faced still remains largely unsolved, but his experiments led to the discovery of the first aniline dye and from it has arisen a great industry. The discovery of oxygen gas by Scheele and Priestley was not considered of any practical significance at the time but its supreme importance was realized only a century later. Chlorine—another gas discovered by Scheele—had not only influenced the progress of pure chemistry but also now plays an important part in bleaching straw, paper and other materials and in the manufacture of chloroform. Saccharin which is of great value in cases of diabetes and other disorders in which ordinary cane-sugar has to be avoided in a patient's diet, was discovered in 1879 while an investigation was being carried out in Prof. Remsen's laboratory that seemed as little likely to lead to practical results as any that could well be imagined. The history of science shows that the greatest advances have always been made by men who undertake their inquiries without the thought of proximate or ultimate practical application or pecuniary reward. Scientific investigations do not progress necessarily on the lines of direct usefulness. Very many applications of the theories of pure mathematics have come many years, sometimes centuries, after the actual discoveries themselves. When Anthony Van Leuwenhoek, the Dutch optical instrument maker, first constructed his crude microscope and described the peculiar little "animalcules" that he saw in stored rain water, who could imagine and visualise that this ignorant, half-mad and crazy man would bring into being a new chapter in medical investigations? Who could foresee the tremendous influence that his observations would exert in discovering the deadly germs of disease?

Laboratories—Temples of the Future

Because "research" does not immediately lead to epoch-making discoveries and does not always bring sensational results, the importance and value of medical research and the need for support by private individuals and philanthropists are yet not sufficiently appreciated. The investment in this direction is generally considered to be fruitless. Once the true meaning of "research" is understood outside purely scientific circles in this country, we hope more sympathy and consideration will be evinced. It is necessary to inculcate in the minds of benefactors that an endowment for research is just as worthy a cause and probably a more worthy cause than undertaking a pilgrimage or building a temple—an inanimate pile of bricks which may adorn a landscape and be the refuge of an army of swindling priests and beggars, but seldom achieves anything more than this. "Take interest, I implore you", wrote Louis Pasteur, the famous French Savant, "in the sacred dwellings which one designates by the expressive term: *laboratories*. Demand that they be multiplied and advanced. These are the temples of the future—temples of well-being and happiness. There it is that humanity grows greater, stronger, better." Pasteur's plea has been amply answered in almost all the progressive Western Countries and in America. Since his days, laboratories for experimental research in all fields of human endeavour have multiplied and they have become the basis and the mainsprings of advance of human comforts and for alleviation of human sufferings.

Medical Research—Not a Field for Amateurs

Discoveries are not made all on a sudden by amateurs tinkering with a few apparatus and toy baloons. The history of all fruitful investigations carried out during the present century shows that only trained workers with a 'call' for research and with patience, imagination and determination, can succeed in unravelling the zealously guarded secrets of Nature. There is no denying that many discoveries have often resulted from accidental observations but to profit by such accidental observations and experiments requires

a well-groomed and acute mind which does not easily develop in an amateur. The Greek legend makes much of the sudden discovery on one fine morning, in the bath room, of the important laws of hydrodynamics by Archimedes. But many people forget that Archimedes was a mathematician of rare ability and was already known for his acute mental faculties before he tumbled upon a discovery.

Support for Research

But how can we ensure the production of such men in this country? How can we foster the development of qualities which go to make a true investigator? People busy in practising clinical medicine and in hospital routine are too pressed for time to concentrate on research. If the major part of the day is spent in fending for a living by knocking about from door to door, it is hardly to be expected that such men, however gifted, will ever be able to increase the bounds of knowledge by well planned and laborious investigations. In his Harveian Oration given to the Royal College of Physicians of London, Sir Edward Mellanby, Secretary of the Medical Research Council, very aptly stated: *"Financial aid either from the State or from private endowment, is an essential to research.* Money cannot of course buy discoveries, in the same way as it can buy manual labour; but it can offer freedom from the need for earning a living by ordinary work, and afford to those with the necessary ability the means to devote their lives to research. In the case of Darwin, private means have allowed leisure for experiment and contemplation. A private society such as the Royal Institution endowed men like Humphry Davy and Faraday in the same way as Trinity College, Cambridge, subsidized Newton. If these men had been completely without financial resources, and dependent for their living on ordinary labour, there can be no reasonable doubt that the particular discoveries associated with their names would not have been made by them.

"On the other hand, the limitations of finance to ensure additions of knowledge are equally undoubted. Some of the best work has been done by men labouring under conditions of extreme simplicity. Would, for instance, the work of Claude Bernard and Pasteur have been better had they received abundant financial support early in their lives? The Harveys, Claude Bernards and Pasteurs of this world will make discoveries under the most meagre circumstances but such men are born very rarely, almost once a century. It is generally true that a genius for research does not look for personal gains and can carry on his life with the minimum of amenities, but even so, there is a limit to this, and the scientific genius when found must be given his chance and not be expected to use up all his time and energy working for a living. In addition to these men of outstanding abilities, there are a large number who, although not men of genius, work out the rich veins discovered by their leader. These men, must also be looked after and given facilities for their work."

State and Private Endowments

From the foregoing remarks, it will appear that there is enough justification in this country for the support of medical research and medical research workers. But where is this support going to come from? There are only two sources—grants from the State and/or private endowments. In almost all progressive foreign countries, generous State endowments are available for the support of medical and public health programmes. The British Government decided to promote medical research more than 35 years ago by setting up a 'Medical Research Council' under the National Health Insurance Joint Commission to operate the funds of the National Health Insurance Act of 1911. Though the constitution and organisation of this body have changed since, funds for the purpose of preventive and curative medical research have been continuously provided for by the Treasury. Some idea of the money spent by the British Government in this direction may be obtained from the fact that the annual grant to the Medical Research Council just before the war (1938) was £195,000 (approximately Rs. 2,730,000/-). During the war this fund was increased several times though the actual figures are not available. Immediately following the war, Great Britain, inspite of her huge financial commitments in other directions, has again given enthusiastic State support for medical and public health research and extra funds have been voted by the Treasury. In addition to this fund, derived directly from State coffers, the Medical Research Council in England is in a position to help in the disposal of certain private endowments for medical research under its direct control, *e.g.,* from the Rockfeller Foundation, Leverhulme Trust, the British Empire Cancer Campaign Fund, the British Empire Leprosy Research Fund, the Halley Stewart Trustees Fund, etc., etc. In America, considerable amount of State support in medical and public health research is available. In fact, the present tendency there is to set apart larger sums of money for *research* and *investigation* in medicine and allied fields, rather than on the purely *curative* side of medical science. This does not signify that the curative side of medicine is getting less attention, but the feeling is gradually becoming uppermost in the minds of medical leaders in America that there are tremendous potentialities in the fields of medical research and as such, all available resources should be harnessed to strengthen the investigational aspects of medical science. Until recently (pre-war period), Germany led the world in her sustained efforts to maintain a strong public health programme through scientific research in the field of pharmaceutical chemistry, chemotherapy and bacteriology. Russia, seeing what medical research has done in raising the standard of health in other countries—especially in America—is reported to have centred her whole public health programme on medical research. She has used, as the central feature of this programme, the Academy of Science under which has been established more than 100 great research institutes for work in scientific and applied aspects of medicine. Her annual appropriations for these institutes are

reported to be larger than any other items in the budget —even the military and defence items.

Private endowments for medical and public health research have been most conspicuous in America and to-day the health index of her population is perhaps one of her most important achievements. Many American wealthy men have made charities towards the cause of medical and public health progress and have established large organisations, such as the Rockfeller Foundation, the Russel Sage Foundation, the Commonwealth Fund, New York City, the John and Mary R. Markle Foundation, the Milbank Memorial Fund, W. K. Kellong Foundation, etc., etc.,—to mention only a few of the larger bodies functioning for years—which form a constant source of inspiration to all those who are interested in a healthier and brighter nation. It is estimated that American Foundations spend about a million and half dollars every year for medical, public health, social welfare and allied cultural projects. Similar interest is also being taken by the British people towards medical and public health research through private donations. In 1936, Lord Nuffield, the famous motor magnate and philanthropist, made a donation of £175,000/- to the University of Oxford for the promotion of medical research. Since then, many other munificent donations have been made by Lord Nuffield and other spirited public men and to-day private endowments for the furtherance of research in the British Isles, though not as large as in the States, is well worth mentioning. A National Fitness Campaign has been launched in Great Britain just before the war and both State and private endowments have been freely provided for its growth and popularity.

Conditions Existing in India

Compare this picture with those existing in our country. State aid for medical research had never been a significant item in our National budget. The Indian Research Fund Association is the only body promoting medical research in India and though this organisation was started as early as 1911, almost simultaneously with the Medical Research Committee of Great Britain, the funds at its disposal for grants-in-aid have not increased significantly on parallel lines with that of the British medical research organisation. In 1937-38, the funds available for research grants were less than Rs. 8 lakhs. The funds of the I.R.F.A. are composed of an endowment and a State grant. The proportion contributed by the State is not definitely known, but during the pre-war period it ranged between 1·5 and 2 lakhs of rupees annually.

Those who have any idea of the gravity of the medical and public health problems of India and the yearly toll of thousands of lives taken by epidemics and tropical diseases, will easily understand the hopeless situation that India is in, and why the standard of medical research in India remained at such a low ebb for years together. Private charities are hardly forthcoming, because our countrymen apparently do not yet seem to understand the true significance and spirit underlying medical research and to what extent it can contribute to the well-being of a nation. A new orientation and a new outlook is necessary in this country to appreciate that on the health of an individual depends the health of a community and the health of a community connotes, in its turn, the health of a nation. A healthy nation can only foster all the seeds of progress and civilization.

In a free India, the first objective of any nation-building activity should be the improvement of the health index of the population and this can only be achieved through intensified medical and public health research from all angles. Time has now come when a bilateral programme of support for medical research should be forthcoming both from the *State* as well as from the *public*. There is needed on the one hand a new type of Government leadership, whereby the leading medical and scientific men of the country should be brought together to make an intelligent and co-ordinated attack on the great problems of disease and suffering which are facing the country, at those points at which modern medical science may offer hope of alleviation or solution. There is needed, on the other hand, a sympathetic and helpful co-operation of the public of the country generally to assist the Government in putting the work of its scientific and medical research organisations, such as the I.R.F.A., etc., or other newer institutions that might be brought into being, on a scale of maximum efficiency and value through added funds and generous endowments. Such a bilateral programme can soon be put into operation, now that a popular National Government have taken the reins of administration in their hands. The time is most opportune also for educative adult propaganda by the leaders of our profession, so that private charities may be canalised towards the most useful direction of medical research and investigation. To-day, modern medicine is at the crossroads. It has to meet the challenge of the forces of evolution and the array of ever-growing scientific facts culled from all directions. Modern medicine in India must move with the times and meet this challenge through more and more medical and public health research. Failure to do so would spell the re-birth in this country of empirical medicine, quackery, charlatanism and all the evils that follow in their train.

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MEDICAL CARE FOR TEA PLANTATIONS

India is the largest producer of black tea in the World. It is mainly grown in Northern India, such as Darjeeling, Dooars, Assam, Cachar, Sylhet and Terai. Southern India also produces a small percentage of the total output of India. 76 per cent of the total area lies in Assam and two contiguous districts, Darjeeling and Jalpaiguri. About 350 million lbs. of tea are exported from India every year. Total capital invested in this industry is more than 100 crore of rupees. The various interests of the industry are controlled by four sets of bodies—Indian Tea Market Expansion Board, The Indian Tea Licensing Committee, Tea Association of Northern and Southern India and in respect of Northern India, the Tea District Labour Association. Most of the tea plantations are on hill slopes between 2,000 and 5,000 ft. above sea level. Road communication in gardens of Assam is good because the plantations are on a lower level. But gardens in higher level suffer from lack of good roads or other means of communication.

In this industry more than 500,000 labourers are employed during the plucking season. This is from May to December in Northern India and from January to December in Southern India. The labour is recruited from the local people and from outside. In order to keep the expenses low, labour is sometimes brought from distant parts of India and trained to pluck 'two leaves and a bud'.

The condition of the labour and the treatment received by them came under scathing criticism from political bodies of our country from time to time. The epidemic and endemic kala-azar in Assam made the health of the workers pitiable before the discovery of antimony treatment. Rightly it is argued that the trade flourished at the expense of the health of the workers. No body looked after people who produced the wealth and their interest went by default. No civilized government would have tolerated such a miserable plight of its own people. In this affair the attitude of both the foreign and Indian tea garden owners were completely apathetic. With the recent development of labour consciousness, there has been much agitation among the workers both inside and outside the gardens for the betterment of their health and living condition, inspite of the threat of oppression from the owners and the alien government. Unfortunately this opportunity has been exploited in some places by a class of professional agitators to confuse the issue by creating disturbances. It must be said to the credit of our present National Government that it did not allow this state of affairs to proceed any further and sent one of its representatives to enquire into the health conditions and suggest standards of medical care for tea plantation in India. The report has now appeared in the form of a booklet.[1] This pamphlet is a revealing document. The author has taken much care in going into the details of his enquiry and recommendations and considered the health conditions and environment of the workers from a new angle almost unknown before 15th August, 1947. The condition of health naturally vary in different parts of Northern and Southern India. But a general idea can be gathered from the following table based on figures of 1946:

	Mortality rate per 1000	*Live birth rate per* 1000	*Infantile mortality rate per* 1000 *live births*	*Maternal mortality rate per* 1000 *cases*
Assam:				
Assam Valley	22·4	30·2	188·0	35·2
Surma Valley	17·4	36·4	149·6	22·3
Bengal:				
The Doars	20·7	34·5	155·1	21·4
The Terai	17·6	28·7	125·7	16·1
Darjeeling	21·9	39·7	121·5	6·8
South India:				
Nilgiris, Nilgiri/ Wynaad	17·1	32·9	105·0	7·2
Annamallais	10·9	25·7	139·7	5·7

The mortality rate hardly gives any idea of the poor standard of nutrition prevalent among the tea garden labour of Assam. The importance of a balanced diet sufficient in both calories and accessory food factors does not appear to be fully realised even by the doctors working there. It has been suggested that the poor standard was mainly due to lack of food

[1] Standards of medical care for tea plantations in India. A report by E. Lloyd Jones, Government of India, Ministry of Labour, 1947.

during the War and the influx of a totally artificial floating population which was responsible for denuding the countryside of cattle, pigs and poultry. It looks that a bold scheme for raising the stock of cattle, poultry and increasing the local production of vegetables and fruits will have to be undertaken. A random, collection of 500 samples of blood showed an average hæmoglobin content less than 50 per cent. Many of the anæmias are secondary, hypochromic and microcytic in type. These are secondary to malaria, bowel diseases and hookworm infection. Hookworm infection is widespread and many doctors in tea gardens think it is universal. Apart from these anæmias, macrocytic anæmia of the nutritional and pregnancy type is very common and is the cause of a large proportion of the enormous maternal mortality. As will be seen from the table the maternal mortality is low in some gardens of Darjeeling and in South India. The reason is that South India is better provided with garden hospitals which are well run and comparatively well staffed. The routine hospitalisation of pregnant women four weeks before the expected date of confinement and a further stay of 10 days after confinement have diminished the mortality. In the hospitals these women are well fed and given a fair ration of milk. There is no reason why similar results should not be capable of achievement in other parts of India.

Malaria is still the common problem with the tea gardens. Kala-azar is endemic in the gardens of Assam. Tuberculosis is increasing in alarming rate in the gardens of Assam and Bengal. The reasons are: bad housing conditions, and the social habits of the people and the high susceptibility of a primitive population to infection.

It is apparent from the short summary that the existing medical relief is totally inadequate. Of course there are exceptions. In some areas the standard is high but in the majority areas the medical care is too meagre. There is a general lack of simple facilities for medical care. It must be emphasised here that in the tea garden population, the vast bulk of the mortality as well as morbidity is the result of conditions arising from poor diet, inefficient sanitation, contaminated and insufficient water supply and the ignorance of the workers, which are easy to recognise and do not ordinarily require elaborate facilities for diagnosis or highly specialised treatment in the early part of any health plan. A good deal of educational propaganda regarding health and sanitary rules are a necessary pre-requisite. It has been suggested in the report that there should be Group (or Central) hospitals in different areas where it will be possible to deal efficiently with any type of case normally encountered. The ultimate target will be to provide 3 beds per 1000 population. In the plan the Central hospitals come next in importance to Garden hospitals to be completed within 3 years. We agree that the primary and urgent need is for the Garden hospitals. It has been recommended that minimum standard of 10 effective hospital beds per 1000 of total population should be provided. These should function as health centres as well as treatment centres. The well-equipped and staffed Garden hospital is the first line of attack against the sickness that is so common in the tea gardens. The report goes into further detail regarding equipment, hospital building, and medical stores etc. If all the recommendations are given effect to, it will cost about Rs. 7/- per head of population served annually.

It is hoped that the tea industry will implement the recommendation at an early date. A *laisser-faire* policy will neither help the industry nor the workers. The report suggests the appointment of medical inspectors in the cadre of the Provincial Medical Service to see that the recommendations are put into practice and also to advise the gardens in the reorganisation of medical services and hospitals. In addition they may institute legal action in cases of infringement according to any compulsive legislation which the Central or Provincial Governments may please to pass.

CURRENT TOPICS

DUODENAL ULCER

At the Royal College of Surgeons on Sept. 22, 1947, Dr. Arthur W. Allen, of Harvard, President of the American College of Surgeons, delivered the Moynihan Lecture, taking as his subject "Duodenal Ulcer."

Dr. Allen began by saying he had not chosen duodenal ulcer as a subject because of the pioneer work done by Moynihan, in whose memory the lecture was founded, for Moynihan, though he carried out important work in this field, had many other interests. He had chosen it because the subject was still in a fluid state. Ideas were constantly changing. No sooner did there seem to be an answer, or a probable answer, to some problem than doubt arose owing to the appearance of apparently contradictory results. Perhaps 10 per cent of patients failed to get along under conservative treatment and came into the hands of surgeons who, after years of trial and error, thought that they had hit upon the solution in subtotal gastric resection. Although it was obvious that this operation was giving a high proportion of good results—a higher proportion than any other method heretofore advanced—he himself began to have misgivings a few years ago. Some patients were not improved after the procedure, and there were a few who seemed to have been made worse. In an analysis of the gastrectomies he had carried out for uncomplicated duodenal ulcer it was obvious that a certain number of the patients had side effects which were perhaps worse than their original malady. Physiologists were continually looking for an explanation of this wayward situation arising in one patient when the previous nine and the following nine had no trouble whatever, and they had turned to the question of hypersecretion and hyper-acidity, without which ulcer of the duodenum did not occur.

In Dr. Phemister's Clinic in Chicago, Dragstedt had brought forward the possibility of treatment of duodenal ulcer by interruption of the vagus nerve. He (Dr. Allen) had a group of his own patients who had been treated by subtotal gastrectomy and had been the subject of a follow-up extending over ten years. In his hospital there was also a group of patients who had been treated by vagus resection with a follow-up extending, however, over a much shorter period (about four years). It was his intention to show comparatively the results obtained in these two groups.

Subtotal Gastrectomy—In the first place Dr. Allen with the aid of diagrams described the operation of subtotal gastrectomy for duodenal ulcer, with certain modifications to meet particular types of cases. The first procedure, which had been followed in the great majority of his own cases, was primary resection with removal of the ulcer-bearing portion of the duodenum. The second was one which he had found useful on occasion for any deep-lying ulcer with adhesions; it was followed in cases in which there was a sufficient amount of free duodenum above the ulcer so that the resection could be done, the ulcer excluded, and nothing left which might produce a recurrence. A third possibility related to patients with very extensive ulceration or adhesions, who might perhaps have had a perforation previously, and on whom it was necessary to operate for mechanical reasons. Here a procedure was resorted to whereby the antrum was cut, the mucosa of the antral segment carefully removed, and the segment turned in. The fourth type of procedure was adopted in certain difficult cases when a two stage operation seemed to be justifiable. Gastrectomy for exclusion was done, but no attempt was made at the time to remove the antral mucosa. Six weeks later, however, another, operation was done on the patient for this purpose. The idea was that this made the operation a safe one for the general surgeon who was not carrying out gastric surgery regularly, and that the safeguard of a two-stage operation would mean a lower mortality and fewer complications. This operation had been undertaken quite extensively at the Massachusetts General Hospitals, but he had seldom found it necessary in his own practice.

An analysis of his 196 consecutive operations on patients with uncomplicated duodenal ulcer, carried out according to the four procedures set out above, is given in the table below.

The mortality was mostly due to difficulty with the duodenal stump, because resection had to be done so low that there was no room to get an adequate turn-up. He had excluded from this list, in order to get a true comparison with vagus resection, those cases which had previously been the subject of unsuccessful surgery and those in the acute stage of massive haemorrhage. On the matter of age, even elderly patients who were bleeding from a duodenal ulcer, if operated on immediately they got over the shock, would show a very low mortality. Actually in twelve patients who were over 65 there was only one death. But, of course, it was a question how much should be ascribed to the particular procedure followed and how much to the generally heightened level of surgery. Surgery in every field was far safer than it was ten years ago. Mortality rates were coming down, and death after operation in the modern hospital was now a rarity.

	(1)	(2)	(3)	(4)	*Total.*
Cases ..	138	20	35	3	196
Deaths ..	3	1	0	4	4

Vagus Resection—Dr. Allen proceeded to show further diagrams illustrating how the section of the vagus should and should not be done. A possible error was inadequate removal of the nerve. The procedure which should be followed was the removal of a long segment, not less than 5 cm., preferably 10 cm., of the vagus nerve, and the encapsulation of the upper end in an impermeable cylinder in the hope that this might delay regeneration. All the cases at his own hospital had been operated on in that way. They did not complicate their cases with gastroenterostomies. They had not carried out this operation for gastric ulcer for the very obvious reason that they were not able to detemine whether the ulcer was benign: 14 per cent of the cases diagnosed as benign ulcer of the

stomach proved to be cancerous. Therefore vagus resection had no place in the surgery of gastric ulcer.

The statistics from his hospital for vagus resections carried out from 1944 to 1947 were as follows:

	Number of Cases	*Deaths*
Duodenal ulcer	.. 75	0
Jejunal ulcer	.. 22	0
Miscellaneous	.. 6	1

The 75 cases were of uncomplicated duodenal ulcer. The patients had undergone various forms of medical treatment. Most of them had been through the hands of the psychiatrist. Finally, when it became obvious that nothing could be done by those means, they were chosen for this surgical procedure because they had no obstruction at the outlet of the stomach or in the duodenum, and most of them were young. Twenty-two cases were operated on for anastomotic ulcer. These were the type of cases in which the procedure he had indicated had its most spectacular effect. This group of anastomotic ulcers could be relieved certainly temporarily by this method, and it was startling to see them wakened from anaesthesia free from pain for the first time for months. He added that the nerves should be injected with novocain before they were severed or manipulated, and the patients should receive large doses of atropine. He showed a radiograph illustrating the appearance twelve days after resection in a case in which there had been a good-size jejunal ulcer, and many such results could be shown. There had been almost no trouble from empyema and complications of that kind. He also showed a curve illustrating the effect which the vogue of vagus resection had had upon the number of private patients coming to him and being treated by subtotal gastrectomy. The curve showed a certain fall during the years in which vagus resection had come into favour, but he added that they were not quite so enthusiastic now about vagus resection as they were at the beginning.

The Methods Compared—Dr. Allen next showed the result of a follow-up extending back for ten years in the cases of subtotal gastrectomy and four years in the case of vagus resection.

	Subtotal Gastrectomy.	*Vagus Resection.*
Number of cases	.. 196	75
Average age	.. 47·4	42·1
Males ..	.. 84 p.c.	84 p.c.
Recurrent ulcer	.. 34 „	14 „
Good result	.. 85 „	87 „
Fair result	.. 7 „	6 „
Poor result	.. 8 „	7 „
Operative mortality	.. 2 „	nil

These were all cases of primary duodenal ulcer. In his own group of subtotal gastrectomies he was ready to claim that 85 per cent showed satisfactory results. Many of the patients had to be questioned very closely to get much in the way of symptoms out of them. The results described as "fair" were those in which the patient was not quite well, was subject to restrictions in diet, and, if not actually showing loss of weight, had to be the subject of considerable attention in order to maintain weight.

The drawbacks attaching to subtotal gastrectomy for duodenal ulcer were a certain though very small operative mortality, a number of cases of anastomotic ulcer, a few cases of gastritis with bleeding, the exhibition occasionally of the "dumping syndrome" (in which three were distress, sweating, and sometimes nausea after eating—but most patients got over it), a certain amount of weight loss which was a problem with some of the older patients, and a gastro-intestinal reflex indicated by loose stools and the like.

Vagus resection had also the drawback of occasional recurrent ulcers. It was hard to say after what period recurrences were no longer to be expected. In his hospital, for example, one-third of the anastomotic ulcers which followed operation occurred within the first year, another third within the second year, but the remaining third were spread over a period of many years. Therefore it was difficult to use the term "end result," and perhaps it should never be used in a situation of this kind. Two of the patients who had undergone vagus resection had persistent ulcer pain after the operation as well as before it; some had pain and bleeding; others had a feeling of distension; eructations were almost the rule, though this was usually transient, and diarrhoea and slight obstruction were not infrequent.

Conclusions—This entire problem should be viewed with an open mind. Vagus resection was a useful procedure and might have a permanent place in the treatment of duodenal ulcer. But unless the results were critically analysed not only of vagus resection but of subtotal gastrectomy, their colleagues who had not the opportunity of following up a group of cases over a sufficient period would be misled. Either an adequate subtotal gastrectomy or vagus resection would give a high incidence of immediate relief in intractable duodenal ulcer. Vagus resection was the procedure of choice in anastomotic ulcer following upon subtotal gastrectomy. It was also to be recommended in intractable duodenal ulcer in younger patients. Vagus resection had no place in the treatment of gastric ulcer on account of the difficulty of distinguishing benign from malignant ulceration of the stomach and because of the excellent results and low mortality obtained by gastric resection in gastric ulcer. In vagus resection the transthoracic approach was the most adaptable for an interruption of the efferent pathway. Obviously many years of experience and careful selection of patients and adequate follow-up would be necessary properly to evaluate vagus resection. Subtotal gastrectomy was, in his opinion, to be preferred for all patients who had superficial obstruction from duodenal ulcer, for those with acute massive bleeding when any operation was indicated, and for those with intractable ulcer in the later age groups.—*Brit. M.J.*, **2**:541, 1947.

NOTES AND NEWS

MEETING OF MEDICAL JOURNALISTS

A luncheon meeting of medical journalists was held some time ago at Bombay. The following were present:

Dr. U. Krishna Rao representing Antiseptic, Health, Madras, Dr. M. D. Pustake representing Arogya Mitra, Gwalior, Dr. V. D. Sathaye representing Indian Journal of Ophthalmology Poona, Dr. B. P. Neogy representing Journal of Indian Medical Association, Calcutta, Dr. J. Mazumdar representing Indian Medical Journal, Madras, Dr. A. N. Roy representing Biological Journal, Calcutta, Dr. P. A. S. Raghavan representing The Miscellany, Trichy, Dr. A. P. Pillay representing Marriage Hygiene, Bombay Dr. U. B. Narayanrao representing Medical Digest and Indian Journal of Venereal Diseases and Dermatology, Bombay.

Opening the proceedings, Dr. U. B. Narayanrao, the host, made a reference to the previous correspondence he had with various colleagues in India and of the response he had received from them. A lively discussion then ensued after which it was decided that it would be advisable to form an Association of Medical Journalists of India. It would create cordial relations amongst them and help in co-operating with the Government, the medical profession and the general public. It would then be also possible to take consolidated measures for and to receive advice in, obtaining all printing materials, paper etc., for the members.

It was generally accepted that only ethical advertisements should be taken up. The question of accepting advertisements from those who use non-medical papers as their media was also discussed. Institution of some sort of black mark against persistently defaulting advertisers or their agents was considered. The point about payment to contributors was thought of. Opinions of other journalists were to be sought on all these points and Dr. U. B. Narayanrao was requested to collect their views and send them round to all.

AMALGAMATION OF I. M. A. AND A-I. M. L. A.

The following is the copy of a resolution passed at the 35th Annual Conference of All-India Medical Licentiates' Association held at Bombay in December, 1947:

"In view of the fact that the Indian Medical Association has changed its rules as desired by the Amalgamation Sub-Committee of the All-India Medical Licentiates' Association at the meeting held at Amritsar in 1945 and as in the opinion of this conference the time is ripe that both the Associations be amalgamated, this Conference authorises the General Secretary to take a referendum forthwith on the question of amalgamation of this Association with the Indian Medical Association under Rule No. 4 m."

RECRUITMENT OF INDIAN PRACTITIONERS BY FOREIGN EMPLOYERS

A note of caution in regard to the acceptance of foreign employment by Indian doctors is sounded in the following letter from the Director General of Health Services, New Delhi, to the President, Indian Medical Association, Calcutta:

"A case has come to the notice of this office in which it is alleged that a medical practitioner recruited from India by a foreign employer found the conditions under which he had to live and work different from what he was led to believe would be available to him. It is accordingly suggested that it may be impressed upon the members of your Association, say through your journal or otherwise, that they should not accept employment under a foreign employer unless your Association is satisfied that the terms offered are suitable and that their faithful observance is guaranteed. I am suggesting to Government that they should similarly assure themselves whenever any Indian Medical Practitioner is recruited for service abroad through them.

"If the above procedure is followed it may be possible for the representatives of the Government of India in foreign countries to render such assistance as they can to Indian Medical Practitioners serving in those countries."

PUBLIC HEALTH IN FREE INDIA

The supreme need for a hygienic environment and expansion of the existing health services to provide for adequate curative and preventive medical care to the people in free India, was stressed by Dr. Jivraj Mehta, Director of Health Services, Government of India, addressing a public gathering at the Lecture Hall of All-India Exhibition at Eden Gardens, Calcutta, on 23-2-48. Dr. Bidhan Chandra Roy, Premier, West Bengal, presided.

Dr. Mehta, who was speaking on "Public Health in Free India", referred to the various problems of housing, water supply, health services, nutrition, physical education and health education and said: "A many-sided attack on community life so as to improve the economic and cultural standard of life can alone place the building of national health on firm and secure foundations."

Although public health and medical relief were provincial subjects, Dr. Mehta assured that the Centre was prepared to assist the provinces in their various public health schemes by grants on fifty-fifty basis. Dr. Mehta hoped that the people would co-operate with the Government in any measure that they might take for improving and maintaining positive health in provinces.

The Premier, Dr. Bidhan Chandra Roy said that today in India, people were free to plan in their own manner. They were free to remove the difficulties and disabilities and the drawbacks which had kept public health in India more or less in a moribund condition.

Comparing the average expenditure per capita per year on public health and medical relief account in India, with those of U. S. A. and England, Dr. Roy said that it was not merely a question of spending

money, but also a question of approach towards the solution of the problems in which the public should be interested. It was not merely necessary that Government should provide better arrangements for public health but it was also essential that everyone should be conscious of the fact that they were citizens of free India and they themselves should think about their own difficulties and defects and suggest remedies, make constructive suggestions to the Government and give them full co-operation when Government was prepared to take any step.

"I have been working", Dr. Roy said, "on some plan which are called pilot plans for West Bengal in different areas on the multi-purpose system and I was surprised at the first instances that there was no co-operation available from the people for whom the work is proposed to be done."

Emphasising the need of developing the community sense amongst the people, Dr. Roy said: "I appeal to you all not merely to understand what your difficulties are individually, but also to understand the difficulties in a group or in a community that is to say, social consciousness should be so developed that it is possible for you all to put forward constructive suggestions for the good of the country. It is only then that we deserve to be citizens of free India."

In his speech, Dr. Jivraj Mehta said that public health in free India was really different from public health in dependent India. In free India public health should be the main consideration for maintenance of economic and political independence of the country.

Dr. Mehta said: "Unless we are strong in mind and in body and unless various factors that make this possible are freely available, we shall not be in a position to retain our freedom."

Describing the present position of public health in India. Dr. Jivraj Mehta said: "It is against this background of ill-health that we have to plan a programme of public health endeavour in free India. In attempting to do so let us consider what the essential conditions are for enabling our people to lead healthy lives. In the first place let us recognise the supreme importance of a hygienic environment for our urban and rural populations, without which medical care, however, elaborately planned, will largely fail to achieve permanent results.

"A healthy environment will include hygienic houses and clean surroundings, the provision of a proper drainage arrangement and of safe water supplies, adequate supervision over the quality and purity of the food made available to the people, effective control of the breeding and dissemination of insect vectors of diseases such as mosquitoes flies, fleas and lice and the provision of parks, gardens and other open spaces with the necessary facilities to promote recreational and cultural activities.

"While it is true that an effective improvement of the environment on the lines indicated is essential to remove the causes of sickness and thus promote a permanent raising of the standard of the public health, there is equally an insistent demand for the relief of suffering and for the restoration of working capacity as far as possible to those who are today not only deprived of the enjoyment of life but are also a burden on others as the result of ill-health.

"Other measures which are necessary for raising the standard of the public health include an improvement of the standard of nutrition, an extensive programme of physical education and of recreational activities including within its scope both sexes and different age groups of the community, and education of the people in personal and communal hygiene in order to enlist their active co-operation in the preservation of their own health."

Dr. Mehta said: "How these things are to be brought about will largely depend on the funds which the public are going to place in the hands of the Government and it will also depend upon the public allowing them to be taxed and to a certain extent upon the economy which is to be practised by Government so that wasteful expenditures are stopped."

EVACUEE DOCTORS: I.M.A.'s SCHEME FOR RESETTLEMENT

Dr. P. K. Guha, Hony. General Secretary, Indian Medical Association, 23, Samavaya Mansions, Calcutta-13, has issued the following press communique:

The Indian Medical Association has taken up the question of rehabilitation and resettlement of registered medical practitioners who have already evacuated from Pakistan, for various reasons and have come to stay in the Indian Union. The doctors concerned have been filling up a form stating their name, age, qualification, previous experience, present and past address and the nature of relief required. Most of these evacuee doctors want suitable jobs with adequate salary and quarters in areas where they can get facilities to educate their children in schools and colleges.

As some of these doctors want to be resettled in areas where they can get suitable quarters, dispensary or hospital facilities and an adequate income from professional work, the Association requests all concerned to kindly supply the above office with all such particulars of facilities which may be made available to them by the industrial and other concerns and the general public. In view of the shortage of doctors in many areas, the Association expects that the necessary facilities may be arranged by many generous industrial concerns, local and other bodies and groups of people for the furtherance of medical relief and public health and for the relief of those unfortunate evacuee doctors.

The Central and Provincial Governments have been asked to assist the Association in this humanitarian work and a fund has also been opened at the above office for rendering interim relief to many of these doctors. All medical practitioners and particularly members of the Association are requested to send their donations, by crossed cheques, made payable to "The Indian Medical Association—Benevolent Fund", to the Association Office at the above address.

INDIAN DENTISTS' ACT

Dr. R. Ahmed, President of the All-India Dental Association in a recent statement says:

The All-India Dental Association records its appreciation, on behalf of the dental profession

in the country, of the National Government and particularly of the Ministry of Health for the passing of the Dentists' Act 1948 in Parliament. This measure was long overdue and India was the only important country in the world that did not have a dental act. During the tour of the Dental Deputation abroad it was forcibly impressed upon us at every stage that until and unless a dental act was passed in India the profession could never achieve international status. This view was communicated to the Ministry of Health and it is gratifying to note that this act now comes on the statute book. The principal feature of the Act is that qualified dentists will be on register 'A' and this register will enable us to enter into a scheme of reciprocity with foreign countries. Unqualified dentists practising for five years will be on register 'B', which register shall cease to exist after the first registration. Foreigners are only eligible for registration if a scheme of reciprocity is established by the Indian Dental Council and their countries. Unlike the Medical Act the penalty for unregistered persons to practise is a fine and imprisonment. The Dental Council of India will be immediately created with representations from all the provinces in the Union to form rules and regulations, prescribe the curriculum of dental education and raise the standards of dentistry to international status. This is a great day for the dental profession in India.

BRITISH EMPIRE CANCER CAMPAIGN

Lord Horder, G.C.V.O., M.D., F.R.C.P., a Vice-Chairman of the Grand Council and Chairman of the Scientific Advisory Committee of the Campaign, while proposing the adoption of the Annual Report said:

May it please Your Royal Highness, Ladies and Gentlemen, it falls to me to move that the Report and Balance Sheet of the British Empire Cancer Campaign for the year ended 31st July, 1947 be received and adopted. I have undertaken this duty several times during the Campaign's history, the last occasion being six years ago.

As a rule, years do not bring a man greater enthusiasm in the pursuit of his main interests, and certainly the present times cannot be said to breed optimism in any walk of life. Yet I find myself more hopeful than ever before about the results of cancer research and treatment in general, and more certain than I have ever been that the Campaign, in particular, is carrying out a great public service and is therefore deserving of the public's continued confidence.

Of cancer research in general I will speak presently. Of the B.E.C.C., and its work, the reasons for my attitude of optimism are several. In the first place we have the great encouragement of Your Royal Highness's leadership. What greater stimulus could we have than to know that, on Your Royal Highness's return from Australia, one of your first expressed desires was to renew your personal contact with the work of the Campaign as its President.

Then, in the second place, our financial advisers cheer us by the news that, despite what Mr. Lockhart-Mummery, in a masterly understatement, calls "the present difficulties of life", the support given by the public to the work of the Campaign has been amply maintained. It is as though people were saying: "even the experts can't give us advice about our investments so let's trust our own intuitions, and put our money into something that is sure to give us a decent return".

Next I would put, as a reason for my confidence, the prestige of the team of workers in the cancer research field whose efforts are made possible by direct subsidies from the Campaign funds. This prestige was never higher than it is to-day. The team includes names of men and women whose contributions to different parts of the cancer problem have been acknowledged the world over. Need I do more than mention Kennaway, Haddow, Dodds, Greenwood, Handley, Mitchell, Mayneord and Passey?

Finally, though this does not exhaust my reasons for confidence, (and overcoming a chairman's natural diffidence in making this reference), the Scientific Advisory Committee of the Campaign has surely never been stronger in its personnel. Here, again, are names to conjure with, both in the biological, the biochemical and the physical aspects of the cancer problem; supplemented by nominations from the Royal Society and the Medical Research Council, the Committee includes such men as Gye, Mervyn Gordon, Hopwood, Jack Drummond, Crowther, and Ralston Paterson. The Committee has been strengthened by the addition of Professor Scarff, to whose energy and editorial ability, in the main, we owe the new "British Journal of Cancer", the Campaign's official organ. Two quarterly issues have now appeared, and the critics have applauded both of them with one voice.

I do not propose to analyse the subject matter of the report. The Editor's facile pen has not failed him in composing his present summary. Whether the approach to the cancer problem be made from an angle that is mainly biological, or bacteriological (using this word to cover virus research), or biochemical, or genetic, or physical, or nutritional, the year's work makes notable contributions. Some of us are glad to note that chemotherapy takes a more conspicuous place, but not a more welcome place, than usual.

I always feel sympathetic towards the layman who tries to read our Annual Reports. The effort must strain his trust in us not a little. It must seem to him so like the "Great Argument" of "Doctor and Saint" seemed to Omar: "about it and about", I wonder if the Editor's able summary, itself highly technical, might not be supplemented by a short, non-technical, survey of the work done, perhaps issued as a separate booklet. Granted that this would not be easy,—it is always difficult to write on matters like these so that the layman may understand and yet verisimilitude is not sacrificed. But I throw out the hint to the Executive, fully aware, as this body is, of the Campaign's dependence upon public support.

On these occasions, Sir, it is customary for the speaker to give a little play to his own ideas concerning the present position, and the future outlook, in respect of the cancer problem. It is a practice that is

not free from dangers. The temptation to encourage the public by saying "we are on the verge, etc."; or, alternatively, "we really can now do something to control" ("control", mark you, not "cure") cancer of this or of that particular organ, is very great. Well, let us not say anything about being on the verge, because that is speculative. But Professor Dodds, my predecessor in this position 4 years ago, has been amply justified in his announcement that the hormone treatment of prostatic cancer was a significant milestone in the slow march towards cancer control.

As for the central solution on the causative side, the x in the equation, Nature still covers her secret against all comers. Many pieces of the jigsaw have been found but the master piece still lies hidden. The biologist is convinced that the solution lies with him, the bacteriologist with him, the geneticist—newly arrived on the scene—with him. But the problem up till now is neither biological, nor parasitic, nor genetic; it is still the problem of the causation of cancer. Mark you again, the causation of cancer, not the *cause* of cancer. For of causes of cancer we have already an abundance. It is estimated that we have experience of more than 300 substances, enormously diverse in their nature, which can cause cancer. "The very sunlight", says Peyton Rous somewhere, "is carcinogenic, and the reason why any of us escape cancer is because its action is weak or episodic." We can uggle (I use the word deliberately) with carcinogens, with oestrogens, with susceptible and with resistant animal strains, with invisible "agents" and with undefined "factors", but the essential causation of cancer in a woman's breast or in a man's stomach still eludes us.

Is this multiplication of somewhat isolated facts, or facts which seem but variants upon a well accepted theme, therefore of no avail? On the contrary, any one of these discovered facts may prove to be a pointer to the goal; nor must we forget the vital importance of confirmation, direct or collateral, of the more fundamental findings. But we must not be slaves to precedent. Precedent may help but it may well be, to quote Peyton Rous again, that "investigators must be more daring in thought and remember that progress in knowledge cannot stand upon precedent".

This does not mean that they should be wild as well as adventurous. Still less need they be barbaric. It would not have entered into the mind of any but a German surgeon to paint a man's skin cancer with a carcinogen to watch the accelerated growth. Even Nature seemed to think this was beyond the pale, for she retorted, much to the investigator's surprise, by causing the growth to disappear!

Planning is essntial,—first the strategy and then the tactics. There are principles that were enunciated many years ago, and they stand as infallible guides today. There was the laconic advice given by Hunter to Jenner: "Don't think, try." And two sentences from one of the greatest researches in any age are even more helpful. "Our senses must inform us", said Harvey, "not our reason,—ocular inspection, not any process of the mind". Again, "no kind of science", said this pioneer, "can possibly flow, save from some pre-existing knowledge of more obvious things."

New facts, new methods and, by no means least, new tools call for both intensification and extension of cancer research and treatment. Given continued support from the public and support on a much more liberal scale, the British Empire Cancer Campaign can still keep in the van. In America, where there has just been a rude awakening to the dimensions of cancer incidence, a Federal grant of 14,000,000 dollars has been made towards cancer research and cancer education. In this country we have to rely upon voluntary help,—it is our British way, and for a long time, at all events, will probably remain the only way. Next year the Campaign celebrates its 25th birthday. The event gives the public a unique opportunity of making the programme which the Campaign has in view, a real and not a visionary one. It is an ambitious programme, and a very expensive one, but it is vital in the public interest. Let me mention the main items.

(*i*) A special committee has been set up to develop research into the whole virus position in relation to cancer. This involves the activation of several "ad hoc" teams up and down the country. The work is already under way and is being pursued with vigour at a number of different centres. There is inherent in this effort a special problem,—the training of the worker in virus technique. Mervyn Gordon, who has had unique experience in virus research, tells us that it takes from six months to two years for even a bacteriologist whose previous studies have been limited to bacteria to master the finer manipulations required in virus work. The Campaign has already begun to finance this special training and must continue to do so, since the personnel available is limited. I spoke of new tools. The ultracentrifuge and the electron microscope are essential in this virus work. The Campaign has set aside a grant of £25,000 for this research, but that amount will need to be supplemented by a very considerable figure as the work progresses.

(*ii*) Travelling fellowships are imperative, with long-term agreements of from 5 to 10 years' duration, if the acute shortage of workers is to be provided against. This applies not only to the virus work but to other pieces of research. Salaries of £1,000—£1,500 per annum in addition to expenses, are estimated for the holders of these posts.

(*iii*) The view that cancer lies outside the scope of chemotherapy is probably premature. Recent work, both on animals and in man, has been quite hopeful and the Campaign requires another special committee set up to organise research, both laboratory and clinical, in this field.

(*iv*) Atomic energy physics has brought new tools, not previously known, of use both in research and in treatment. These tools must be made available to B. E. C. C. workers. They are very expensive but they are essential to the progress of cancer research.

(*v*) I mention last the great need of education with regard to cancer, both of the doctor and of the public. Whilst research into causation pursues its steady but slow progression thousands of lives are being lost every year through want of diagnosis during the curable stage of the disease. Not only so, there is also the question of prevention; here is more need for

education. An American physician closed a recent paper on the Prophylaxis of Cancer by saying "I have discussed nearly forty ways of interfering with the development of specific cancers. If the public and the medical profession were to give more serious attention to our present possibilities of *preventing* cancer, the magnitude of our cancer problem would be materially lessened." Here is more useful work for the B. E. C. C. A reconstruction of the Central Propaganda Committee with a view to undertaking educational work is at present under consideration.

Your Royal Highness, Ladies and Gentlemen, I have given you the reasons for my confidence in the future of cancer research and in the great contribution that our Campaign can make to it. Surely the British public, whom the Campaign has served faithfully all these years, will stand by it in every special measure now, when it is faced with great and new demands upon its resources. The Campaign's 25th anniversary, as I have said, gives its sponsors an exceptional opportunity of re-affirming their confidence and by their generosity hastening the day when this menace to life and happiness will have passed. I believe that the opportunity will be taken.

DRUG ADDICTION

In a comprehensive review (*Bull. Health Org. L.O.N.*, **2**:4, 1945-46) of the many therapeutic difficulties presented by the drug addict we are early reminded that addiction is a manifestation of a morbid state and that the victim must be treated as a patient. It is a mistake to apply the term "drug addiction" to all cases in which drugs cause euphoria. The cocaine habit is often just an indulgence in vice rather than a state of true addiction; the taking of cannabis always falls into the former category. For a proper understanding of the state of addiction it is well to refer to Himmelsbach's definition of what he terms a "physical dependence." This is an acquired abnormal state wherein the regular administration of adequate amounts of a drug has, through previous prolonged use, become indispensable for physiological equilibrium. The demonstration of this state can be made only by withdrawal and the production of withdrawal symptoms. They are classified as (*a*) mild: yawning, lacrimation, sneezing; sweating; (*b*) moderate: tremor, gooseflesh, anorexia, mydriasis; (*c*) marked: pyrexia, rise of respiratory rate and systolic blood pressure, insomnia, restlessness; (*d*) severe: vomiting, diarrhœa, loss of weight.

Not every person who takes a habit-forming drug is a drug addict. Only 19 per cent of patients admitted to the Narcotic Hospital in Lexington were found by Himmelsbach to be really dependent on drugs to an extent sufficient to render their cases suitable for study. It is suggested that many alleged addicts have merely a mild drug-habit with only slight physical dependence. This may be due in great part to the adulteration of supplies by "dope pedlars" and to the recurrent difficulty in obtaining opiates. The importance of the foregoing is that accurate apparaisement of the category to which the patient belongs must precede assessment of treatment. Thus a chronic morphine addict habituated to the drug given therapeutically can be much more readily detoxicated if the therapeutic indication has disappeared than can the morphine addict who is predisposed to addiction and whose unstable mind leads him to search for euphoria. The distinction is not always easy to make, because a potential addict may in fact become one owing to the development of a disease requiring morphine.

The need to consider prophylaxis is emphasized by the statement that no person is immune to opiate addiction; if morphine is given to 100 people regularly for a certain time it will produce abstinence symptoms in all of them. In many countries prophylaxis is already carried as far as can reasonably be expected: control of the sale of drugs and the limitation of their use to doctors, dentists, and veterinary surgeons are governed by stringent regulations. It is suggested that more could be done in the direction of educating doctors to use euphoric drugs only when the simple analgesics fail, and then to aim at an initial dose which while sufficient to relieve pain will not be large enough to cause euphoria. Morphine suppositories are said to have the same therapeutic effect as injections, and should be preferred. Against this it might well be argued that a patient will quickly link the suppositories with relief of pain; furtive self-administration would be simplified for the addict, and nursing attendants would be as likely to use them as an injection. The prescription of cocaine, except for direct application by a surgeon, is never justified. There is no risk in refusing cocaine to an addict, because, in contrast to the use of morphine, dangerous abstinence effects never occur, even in the severest cases.

In treating those addicted to opium and its derivatives it is generally agreed that rapid withdrawal is correct. Institutional treatment is essential. The doses of the drug should be so reduced as to avoid serious withdrawal symptoms. The aim should be to stop the drug in ten days. More prolonged withdrawal is no more bearable to the patient, while it certainly prolongs the discomfort, and this leads only too often to his discharging himself. This raises the question whether a law for compulsory treatment should not be enacted. Personal liberty for an addict whose mind is warped by craving is hardly in the public interest.

The report recognizes the existence of morphinists and opium eaters who appear to be in an "arrested development" stage of addiction. They remain addicted to small and constant doses of the drug, and are efficient and healthy. Stopping the drug makes them ill and incapable of work. Treatment of this group is unnecessary, and possibly dangerous in that it may lead to true and progressive addiction. The greater part of the report is devoted to a detailed consideration of the methods of cure, and pours a salutary cold douche on the many claims for dramatic cures without tears. This work is admirably compiled and worthy of detailed study by those who may be given the responsibility for the cure of a drug addict. It is the last number of the Bulletin of the Health Organization of the League of Nations. It successor will be the Bulletin of the World Health Organization.

—*Brit. M. J.* **2**:965, 1947.

FIGHTING T. B. MENACE IN INDIA

The World Health Organisation have agreed to send a B.C.G. demonstration team to India by about the end of May, to popularise B.C.G. vaccination and show to the authorities concerned the process of manufacture of the vaccine and the technique of administration. The B.C.G. laboratory will be located at the King Institute of Preventive Medicine. Guindy, while the field operations will in the first instance be carried out near Madanappalle under the supervision of the authorities of the Union Mission Sanatorium and later extended to other areas.

The W.H.O. team is expected to work in India for four months. In order to continue and expand the work initiated by the team, the Government of India have selected an experienced bacteriologist and a technician and propose to give them special training in the manufacture of the vaccine at Copenhagen. As it is extremely important to maintain a uniform standard of potency and efficiency and to prevent all possible chances of contamination with the virulent organisation of the disease, it is proposed to confine the production of the vaccine to the Guindy Institute at present.

BOMBAY MEDICAL COUNCIL

The President, Bombay Medical Council writes:

Considering that hundreds of thousands of people might die as a result of importing a person infected with yellow fever, stringent regulations have been passed and insisted on regarding inoculation of all persons likely to pass through the endemic areas of the disease or travelling in planes which have passed through the endemic areas.

Unfortunately the seriousness of the possibilities is not realised by some members of the travelling public. Some of these bring severe pressure to bear on medical practitioners to issue a certificate that an inoculation against yellow fever has been carried out when in fact it has not been done. Some of the medical practitioners yield under the pressure and issue a false certificate. As all such certificates are checked at the port of entry, the falsification is easily detected. When so detected and the case proved against the practitioner, his name is struck off the medical register.

Yellow Fever Vaccine—The vaccine used in India is manufactured by the Rockfeller Foundation The vaccine is also prepared by Messrs. Burroughs Wellcome and Co. in England. It is also produced in South Africa.

The vaccine cannot be imported into India without the permission of the Director General, Medical Services, India. If any is imported by accident, the D. G. must be immediately notified and permission for retaining it obtained. It is an offence to possess the vaccine without the permission or knowledge of the D.G.

At present the vaccine is donated to the Government of India by the Rockfeller Foundation. The Government then distributes it to the various provincial laboratories, which alone are authorised to vaccinate against yellow fever. The certificate of inoculation can be signed only by the director of the laboratory or by his nominee. For the Bombay province the Haffkeine Institute, Parel, Bombay, stores and injects the vaccine.

The vaccine is not issued to medical practitioners. Under direction of the D.G. the vaccine is sometimes sent out to places where the need may arise, with all due precautions regarding its preservation. A record of all such vaccine sent and of all injections of the vaccine is kept by the Haffkeine Institute. All yellow fever inoculations are given free. About a thousand inoculations are made every month.

The vaccine consists of the virus of the disease modified by numerous passages through the mouse, mixed with yellow fever immune human serum and then frozen, dried and sealed in glass ampoules. Each batch is numbered. The vaccine must be stored at or below the freezing temperature. If exposed to a higher temperature it deteriorates rapidly so that it becomes useless in about three hours at room temperature. The vaccine loses efficacy even when kept at freezing temperature in about three months. Periodic checks are made of a batch by inoculating white mice, who develop a paralysis of the hind legs within 10 or 12 days if the vaccine is potent.

The vaccine comes in ampoules of 20 or 100 doses. It is a yellowish white powder. Before use the requisite quantity of sterile normal saline is added so that each dose is contained in half a c.c. The solution must be used within three hours.

There is no fever or other reaction after the injections. Immunity is developed after 10-14 days and lasts for four years.

THE INDIAN PHARMACEUTICAL ASSOCIATION

N. K. Basu, Acting President writes:

In a Council meeting, presided over by Mr. M. L. Schroff, held at Patna on 3rd January, 1948, Mr. Schroff resigned from the membership of the Association. Later on, he wished to withdraw his resignation in the Annual General Meeting held at Patna on 4th January, 1948, and was asked by the Chairman to do so in writing. The letter of withdrawal of the resignation has not yet been received by the Council. Mr. Schroff, therefore, has ceased to be a member of the Association.

Prof. D. N. Majumdar continues to be the Honorary Secretary of the Indian Pharmaceutical Association whose headquarters still remain at Benares.

All communications for the Association should be forwarded to Prof. Majumdar addressed as follows: —Prof. D. N. Majumdar, M.SC., A.I.I.SC., Department of Pharmaceutics, Benares Hindu University.

Any communication received from Patna or elsewhere under the signatures of Mr. M. L. Schroff or Mr. S. B. Lal is completely unauthorised.

THE AMERICAN SOCIETY FOR THE STUDY OF STERILITY

The American Society for the Study of Sterility is holding its Fourth Annual National Session on June 21 and 22, 1948, at the Congress Hotel in Chicago. The two-day program will be divided into a special series of panel discussions on male infertility, with papers to be read on female and miscellaneous infertility aspects on the second day.

The chairman this year is Professor Edwin C. Robertson, Chairman of the Department of Obstetrics and Gynecology of Queens College, Ontario, Canada.

Additional information may be obtained from the secretary, Dr. John O. Haman, 490 Post Street, San Francisco 2, California.

BRITISH HEALTH SERVICE

The British medical profession is to hold a second plebiscite on the Government's Health Service due to start on July 5.

Britain's 56,000 doctors will be asked to reconsider whether they should co-operate in the Service now that the Minister of Health, Mr. Bevin, has agreed that they will not be compelled to accept a basic State-paid salary unless they are in the first three years of their practice.

He has also promised an amending Bill which will make it impossible for the Government to introduce a wholetime salaried State Medical Service by a departmental regulation instead of by an Act of Parliament.

The decision on another plebiscite—the first one overwhelmingly rejected service under the present Bill on the ground that it paved the way for a full-time State Service—was taken on April 14 last by the Council of the British Medical Associations.—*The Statesman.*

CARDIOLOGICAL SOCIETY OF INDIA

A meeting of the medical men and women of India interested in the subject of Cardiology and called under the auspices of the Cardiological Society of Bengal, was held at the Hall of the Indian Medical Association, Calcutta, on the 4th April, 1948, and a Society was formed under the denomination of *"The Cardiological Society of India."* Dr. B. C. Roy, M.D., D.SC., M.R.C.P. (LOND.), F.R.C.S. (ENG.) was elected President of the newly formed Society.

A provisional constitution presented by the Jt. Hony. Secretaries of the Cardiological Society of Bengal was discussed and accepted with some modifications.

All members of the Cardiological Society of Bengal and all present in this general meeting and all those who had expressed their desire to become members of the Society or were elected to the Executive Committee, were declared Foundation Members of the Society. Annual Subscription was fixed at Rs. 12/- and Life Membership at Rs. 250/-.

Immediately afterwards a special general meeting of the Cardiological Society of Bengal was held and a unanimous decision was taken to dissolve the Society and merge itself along with its assets with the Cardiological Society of India.

The Society is proposing to bring out the first issue of the Journal during the annual Conference of the Society expected to be held in December, 1948, along with the All-India Medical Conference. All communications to be addressed to the Jt. Hony. Secretaries, Cardiological Society of India, 67, Dharamtala Street, Calcutta.

OBITUARY

DR. H. R. MADAN, M.B., CH.B., D.T.M.

Dr. Hans Raj Madan, M.B., CH.B., D.T.M. etc., one of the most popular and respected citizens of Amritsar and a shining light of the profession died at the age of 55 after a very brief illness.

There was hardly a function, public or private, in which Dr. Madan was not an ornament, and his unassuming personality and charming manners won for him his great popularity. Starting his career as a medico in 1915, he rapidly rose in practice, and was at one time President of the Amritsar Branch of the Indian Medical Association.

He was liberal-hearted, and spent freely on the poor.

Our sympathies go out to Mrs. Madan, his aged mother, and the children.

REVIEWS

PSYCHOLOGICAL MEDICINE—By Desmond Curran and Eric Guttmann. Second Edition, 1945. Demy 8 vo, pp. 256, with 20 illustrations. Published by E. & S. Livingstone, 16 & 17, Teviot Place, Edinburgh. Price 10*s*. 6*d*. net.

The war has proved beyond doubt that though the fittest men are taken in the army, many of them get mental breakdown under stress, differing with different individuals. The condition is not different under civil conditions. About thirty per cent, if not more of outdoor attendances suffer from psychiatric illnesses. Though every up-to-date hospital now-a-days possesses a special psychiatric department, it is not possible to send all patients there. It is necessary, therefore, that every general practitioner should be conversant with the general principles of psychiatry. To serve that purpose, a small book giving lucid descriptions of all important matter in a concise form is necessary. This book is excellently suited for that purpose to every student and general practitioner. It has also given the fundamental necessities for any examination in psychiatry. The appendix on war time psychiatry includes direction to prevent mental breakdown and how to treat it. Now that the war is over, it will be of great help to the readers if the writers give a greater detail about the legal aspects and therapeutic methods.

C. C. Saha.

PRACTICAL TEXT BOOK OF LEPROSY—By R. G. Cochraner, 1947 pp. xii+283, Illustrated Published by Oxford University Press.

Leprosy is a great problem in the tropics. Majority of the books published so far on the subject dealt with the theoretical aspects of the disease. So a practical text book like this was very much needed. The author is well known among leprosy workers in this country and in his book he has put forth his very valuable and long practical experience on the subject in a very lucid manner.

The book starts with an introductory chapter dealing with the history, spread and modern outlook of the disease. Then the other chapters are devoted to the discussions of etiology, epedemiology, pathology, diagnostic serological tests, signs and symptoms, technique of examination, development of atypical lesions, differential diagnosis, reactions in the disease, lesions in particular organs, treatment in general, treatment of other associated diseases, prognosis and lastly two chapters devoted to discussions for prevention and practical methods of control of leprosy.

The chapter on classification is written quite scientifically. So also the chapters on treatment. Thev are quite exhaustive and upto-date. Moreover all possible conditions in leprosy have been dealt with separately. These are very helpful.

The book is full with clinical illustrations which have enhanced its value. The get-up of the book is nice and the printing and quality of paper remarkably good for which the publishers should be congratulated.

In fact the book will surely fill up the gap long felt by the students, general practitioners as well as the specialists.

B. N. Banerjee.

PENICILLIN IN V. D.—By K. D. Lahiri. 1947. Pp. 108. Published by Himalaya Publications, Patna.

In this small book of 108 pages, the writer has summarised the present position of penicillin in the treatment of syphilis, gonorrhoea, gangrenous balanitis, chancroid, grauloma inguinale, lymphograuloma inguinale and yaws. The last mentioned condition ought not to have come under the category of venereal diseases and it would be better if this disease be expunged in the next edition of the book. Nowhere the writer gives any indications that this disease is a non-venereal one. The chapter on streptomycin is much too sketchy and should either be deleted or made more useful with adequate notes. The writer has almost developed a habit of remarking that in India the dosage of penicillin should be such and such, without adducing any reasons for his statement.

In spite of such minor criticisms, it is felt that there is need for such handy books for helping the general practitioner and the junior specialist in venereal diseases. A good deal of useful material has been compressed between its two covers.

H. K. Ray.

AN ASPECT OF INDUSTRIAL ABSENTEEISM AND ITS METHOD OF CONTROL—By Arun Ganguli, Dentist, Calcutta. Price Re. 1.

This pamphlet of 15 pages discusses the aspect of industrial absenteeism in respect of dental ill health. The writer is quite conscious that dentistry does not lend itself to mass production method, but he wants indoctrinisation of workers mind with regard to dental health.

Industrial Absenteeism has become the greatest bottleneck of India's industrial progress. A frontal attack must be made now to tackle this problem. It has been estimated that 10 per cent of the labour force in any industry is always absent and not less than 30 per cent is off at harvest time. Recently absenteeism of labour added to labour unrest is keeping down production at a time when scarcities are so acute. The main problem of the medical profession is to investigate, prevent and cure absenteeism due to sickness or occupational injury. Occupational injury is a term of wide reference. Apart from accidents, various industries have different hazards which can be prevented. This requires a specialised study of Industrial Medicine and does not come within the orbit of a general practitioner. This speciality has got to be developed at an early date if we want to avoid the crisis in the Industry through which the United Kingdom passed just after the industrial revolution. We are glad to know that our national government is fully alive to this situation and steps are being taken to develop Industrial Medicine.

B. P. Neogy.

CORRESPONDENCE

The Editor is not responsible for any views expressed by contributors

DISEASE WARFARE

SIR,—I seek your aid to clarify a point that may be vital in the future.

We know that the Atom Bomb inhumanly destroyed unprepared civilians in Japanese cities. We know that Japan was badly let down by her scientists, because they were not up to the minute in their researches, in this matter, and they were not able to bring home the danger of the atom bomb to the Japanese War Lords.

There is talk in the lay press (American) that the future may produce further innovations in military weapons amongst others Disease Warfare.

This Country's advance in the Medical Scientific World is the sacred trust of the medical profession.

Will any authoritative medical scientist of this country interested in this matter, say to the best of his knowledge how far the rest of the world, particularly Russia has advanced in Disease Warfare, and epidemic bomb manufacture, without disclosing our own advances, if any.

Whether such a bomb is possible or not, could you elicit the opinion of the Indian Medical Association through the columns of the Journal if it is human and ethically justifiable to work and aid the nations military authorities in using disease warfare.

If it is not, could we now, build public opinion, in India and later in the world, so that all nations may agree that disease warfare may never be used on this Earth. I am etc.

Deolali, 14-1-48. J. L. G. PINTO, M.B.E., M.B.B.S. I.M.S. (LATE)

CHAIR IN DERMATOLOGY

SIR,—Tropical skin diseases now form a definite part in tropical medicine. May I request you to kindly write an editorial on the necessity of (1) organising the dermatological study including venereology in India, (2) to have separate departments of skin and V.D. attached to every medical college, (3) in the final medical graduation examination one question on skin and one on V.D. must form a part of medicine, (4) study of skin and V.D. to the final year students of the medical colleges for at least 2 terms is necessary, (5) professors in skin diseases which should include V.D. should be appointed to facilitate study and research in skin disease and V.D. in India, (6) professorship in skin diseases have been created in America and in England and it is high time that in Indian Universities and Medical Colleges, professorship should be created also as tropical skin diseases have been attracting attention of the medical world. I am etc.

K. D. LAHIRI.

Patna Medical College Hospitals,
Patna, 20-2-48.

BELLARY BRANCH, I.M.A.

SIR,—I am herewith forwarding the following resolution moved by the members of the above Association at a special meeting held on 30-11-47 and passed unanimously:—

"The members of the Association strongly protest against the proposed levy of sales tax by the Government of Madras on the doctors running their own dispensaries and dispensing medicines to their patients in the course of the treatment, inasmuch as the mixture given is not a sale effected and that it is given as part of the treatment and diagnosis of the patient and professional service rendered to him; hence it is unfair and derogatory to the prestige of the medical profession, to levy the said tax on the medicines, and request the Government to exempt the doctors from the purview of the act." I am etc.

19, Goldsmith St., Bellary, 18-2-47. U. K. L. NARAYAN RAO *Hon. Secretary*

GRANULOMA VENEREUM

SIR,—In the 3½ years in which I have been working in the V. D. Department I have not yet come across a case in which both husband and wife had both contracted granuloma venereum. In our clinic each husband is asked to bring his wife and each wife the husband, and as our men and women are treated side by side they generally come together. In the last year 1947 we saw 17 cases of granuloma venereum, 14 female and 3 male cases. Most of the patients give a history of at least 6 months duration and continue to live with their sexual partners during the progress of the disease. In most of our cases Donovan's organisms have been detected in the scrapings from the ulcer. If this is the causative organism what other factor is present or absent—in the sexual partner that he too does not acquire the disease? If other practitioners have noticed this I would like to hear from them, and also be advised as to what lines of investigations we would pursue to find out the cause of this anomaly. I am etc.

EDNA I. GAULT,
M.B.B.S., D.T.M.,
Officer-in-Charge, V. D. Dept.

Christian Medical College Hospital,
Velore, 3-2-48.